Industrial FINISHING

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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Infra-Red Baking; Metal Cleaning

We are contemplating putting in our own industrial finishing department and we would appreciate receiving a copy of your publication. We are especially interested in the infra-red ray baking method. Also, cleaning and washing operations on steel products. Any information you might have on these two subjects will be highly appreciated.—K. T. Stamping & Mfg. Co.

Sandpaper to Brazil

I would be very thankful to you if you would send me the Jan. 1940 issue of INDUSTRIAL FINISHING which I have not received. I am a subscriber to your magazine and will renew my subscription through the company whose representative I am in Brazil.

At the same time I would appreciate it if you could supply me with the names and addresses of manufacturers of sandpaper, sanding discs and abrasives. I am in the paint line and would like to have a complete line to work with my customers.—Vlademir G. Tolp, Rio De Janeiro, Brazil, S. A.

Castor Oil Article

We were tremendously interested in the castor-oil article on page 73 of your November issue. We are sending you a recent article on our activities here (Brownsville, Texas), a by-products chart and a growing-cycle chart which shows the castor bean can produce from three to four crops a year here in Brownsville. Just thought you might like to have this information.

EDITOR'S NOTE: According to the Brownsville newspaper article, Woburn Industries of Harrison, N. J., recently started operation of a plant in Brownsville, Texas, for the manufacture of castor bean products, including castor oil. More than 8000 acres of castor plants are under cultivation in southern Texas. Quoting part of the article:

"Castor does not displace a single American crop, but merely displaces products that are being imported today from foreign countries. All castor beans for manufacture of castor oil have heretofore been imported from Brazil."—Col. W. E. Talbot.

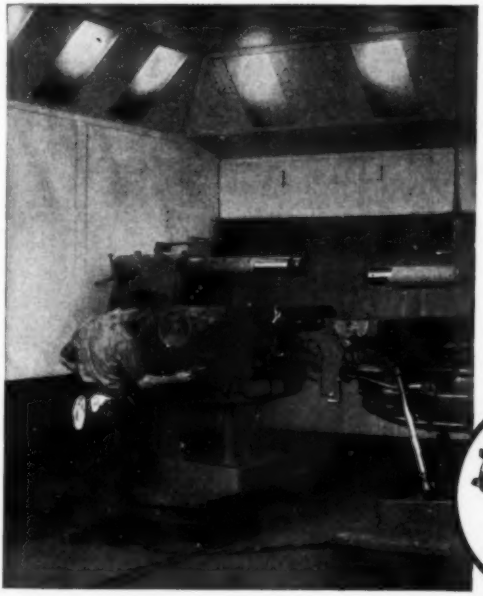
Luminous Paints

We are interested in securing information on flourescent and luminous paints. Any information you can give us on these will be greatly appreciated.

In the Oct. issue of your magazine, there is an inquiry in regard to flocked pliofilm-pliosuede, by Cellusuede Products, Inc. We would also like to have any available information you may have on this.—T. M. Co. (Metallic Caskets).

We understand that there is now being marketed a luminous paint and we are interested in learning to whom we may look for our requirements.

This paint is not to be confused with the prismal paint which is being used by some of the state highway



RIGHT .. 100%

For This Machine Finishing Job

Whether you're "dressing-up" big machines or fine chinaware, there's a lot of difference when you use a finishing system that's geared for its particular work. To get top speed, peak efficiency, lower costs, you need the DeVilbiss Spray System that fits its job 100%.

From more than 30 DeVilbiss spray guns and hundreds of nozzle combinations you can pick exactly the right gun for your materials and operations. Among the material containers from 2-ounce cups to 120-gallon tanks is one that fits your needs completely. There are air compressors, purifiers and regulators for intermittent touch-up work or continuous, high-speed production. Whatever your air or fluid hose requirement may be, you'll find a DeVilbiss type that's built to meet it. You can choose the best design of exhaust equipment for your work because DeVilbiss has every size and style, from small bench booths to the largest canopies. And all units of DeVilbiss Equipment are coordinated to function perfectly together as a complete finishing system.

Look at the completeness of the DeVilbiss Line for what it means to you in finishing speed and economy.

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Canadian Plant: WINDSOR, ONTARIO

DeVILBISS SPRAY SYSTEMS

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Season's Greetings

At this time of the year we pause to reflect on the many friends and customers we have been privileged to acquire during the year. Likewise we pause to extend our deepest appreciation and heartfelt wishes for a Happy Holiday Season.

And if you haven't yet gotten into Flocking, it's time to seriously consider it for 1941. The ease with which Flocking is done, the utterly different appearance it gives, the many avenues it opens for more business and greater profits, can aid materially in your progress during the year.

SAMPLES AND COLOR CARD SENT ON REQUEST

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's leading manufacturer of

COTTON, WOOL AND RAYON FLOCKS

departments and on which a glass bead preparation is sifted to bring out the desired results.

We shall greatly appreciate your kindness in advising who, to your knowledge, manufactures the type of paint in which we are interested.—E. Mfg. Co. (Unit heaters).

Masking Paste

We did not see the article on "Masking Pastes and Liquid Rubber Compound," in Sept. issue, but we are very much interested in it. We manufacture storm sash and would like some system of covering the glass while putting the finish coat on the frames. Will you please give us the names and addresses of manufacturers of such materials?

The subject was mentioned in a letter on page 7 of your issue of Nov. 1940.—Y. S. Co.

Information given.—ED.

Tumble Finishing

On page 4 of your Oct. issue, a reader has asked the editor for information regarding the tumble finishing of furniture knobs. We would like to know somebody who can tell us how to tumble a gloss finish on knobs.—C. A. Co. (Wood Turning).

We are interested in tumbling barrels for use in lacquer coating and will appreciate receiving any information you may have in regard to the names and addresses of manufacturers of such equipment.—H. T. Glass Co.

Jewelry Finishing

By chance your interesting issue of August has come my way. May I ask your help in obtaining offers for:

1) Baking ovens in which I can enamel jewelry.

2) Process of producing, on copper or other metals, photographs and varnishing same.

As you are aware, in the cases of enamel paints and varnish for jewelry, the temperature of the oven must be in relation to the cowell heating point of different paints or varnishes.—F. S. N., Johannesburg, S. AFRICA.

Author's Full Name

We are compiling our Annual Author Index to Chemical Abstracts and shall appreciate it if you will help us out by giving us the full name (first and second) and address of D. G. Miller whose paper appears in INDUS-

OUR NEW finishing room and laboratory are now open. All responsible firms are invited to submit furniture or panels for "Finish Analysis and Suggestions."

If you care to do so, you may submit sample showing your present finish together with an unfinished piece. If we can't improve your finish, we will admit it promptly. If we can—we'll finish the piece *completely*. In either case, it will be returned *prepaid* with our comments or suggestions.

ALSO—Everyone replying to this ad will be sent a liberal sample of

No. 1900 WATEROIL CLEAN-UP POLISH

We guarantee "you'll like it"!!

V. J. Dolan & Co., Inc.

Manufacturers of "Unquestionable Quality" Industrial Finishes

1830 N. LARAMIE AVENUE
CHICAGO, ILL.

TRIAL FINISHING, Vol. 16, No. 4, 14-16; No. 5, 46, 48, 50, 52.

May we hear from you soon, please, as our index must go to the printer within a short time.—"Chemical Abstracts," Published by The American Chemical Society.

Information furnished.—ED.

Rubberized Crack Filler

Please give me the name of the rubberized material used for insertion between bathtub and wall, where a space of about 3/16-in. appears, owing to settling.—A. T. Co.

Safe Lacquer Room

We are contemplating erecting a new lacquer room and would appreciate your advising whether you have any information on the construction of these rooms, so that they conform with building and fire department specifications.—B. & Sons (Lighting Fixtures).

We suggest that you write the National Fire Protection Assn., 60 Batterymarch St., Boston, Mass. This association has printed bulletins dealing with this problem, and we feel sure that they will be glad to send you a copy of one of them.—ED.

Infra-Red Lamps

We are interested in infra-red lamps for industrial baking purposes. Kindly send us any literature you have on this subject; also names of manufacturers whom we should contact, regarding this equipment.—A. R. Co. (Special Machinery).

Information supplied.—ED.

Roller Coating Discs

In your journal, INDUSTRIAL FINISHING, about three years ago you had a photograph and an article showing and explaining a machine that coats aluminum blank recording discs. The machine consisted of several gelatine rollers and the blank aluminum discs went in the machine at one end, were coated with a substance, baked until dry, and came out the other end all finished and ready for sale.

This information was given me by a firm in Sydney, N. S. W., Australia. I have been unable to procure a copy of INDUSTRIAL FINISHING so far back,

IT'S REALLY TOUGH!

Flo-Bak Y-536 CLEAR

A HIGH SPEED LINE OF BAKING SYNTHETICS

A clear easy flowing synthetic finish, absolutely water white. Specifically formulated for adhesion to copper and brass. Ideally suited for products requiring a clear, tough protective finish.

- **Hard tough finish**
- **High Lustre**
- **Excellent retention of gloss**
- **Resists acid, alkali, alcohol**

[Baking schedules are adjustable to most finishing schedules. 300° F. for 10 minutes — 275° F. for 20 minutes.]

Full information and samples sent on request.

LACQUERS THINNERS ENAMELS METALIZED FINISHES SYNTHETICS

UNITED LACQUER MFG. CORP.

General Offices and Factory: Linden, New Jersey

containing the article in question, and wonder if you could be good enough to search the files of INDUSTRIAL FINISHING for the address of the manufacturer of the machine and let them know that I am very much interested in it and would like to have all particulars, such as price, output, if it is dustproof, if it requires a dustproof room, will it do discs up to 17¼-in. in diameter, life of gelatine rollers, and if convenient a sample disc turned out by their machine—and finally, are the machines in stock or made to order?

Our company's directors are firmly resolved to go ahead with one of several schemes to manufacture blank recording discs here in Sydney, N. S. W., but I am asking them to wait and examine the possibilities of this rolling machine which was featured in INDUSTRIAL FINISHING about three years ago. I will appreciate all you can do for me in regard to this at your earliest convenience.—A. E. W.

We do not recall of having published an article dealing with the coating of recording discs, but we have published several write-ups about roller-coating machines. Probably some of these machines can be adapted to the work you have in mind. In order to save time on this matter, we are notifying several of these concerns about your inquiry and it is possible that you will hear from some of them soon.—ED.

Graining Paper

Referring to "Letters from Readers" of INDUSTRIAL FINISHING, for March 1940, we will appreciate receiving the names of manufacturers of transfer graining paper for reproduction on metal and moulds.—E. Mfg. Co. (Engineers & Manufacturers).

Air-Dry Wrinkle

Would you please give me the address of a manufacturer of a good over-night air-dry wrinkle finish, to be sprayed on directly over metal?—R. C. (Paint Foreman).

Striping Tools

On page 19 of your Nov. 1940 issue there is an illustration of a striping tool made by the Beugler Mfg. Co. We will appreciate your sending us the

address of this company.—R. S. Co. (Fine Store Equipment).

It would be appreciated if you would kindly provide us with the names and addresses of several manufacturers of striping tools. We recall that the Beugler Mfg. Co. makes these items, but we do not have their address.—J. J. Co. (Finishing Materials).

Can you send us by return mail the address of the Beugler Mfg. Co.—N. C. Co. (Furniture).

It is 4313 W. 2nd St., Los Angeles, Calif.—ED.

Carnauba Wax

In the July 1940 issue of INDUSTRIAL FINISHING, there is an interesting article about "Wax Finishing Raw Wood" by W. T. Smith. Kindly send me the names of one or more companies that sell straight carnauba wax in lump form.—H. D. C. (Finishing Foreman).

Spraying; Dipping

Can you give us a list of manufacturers of dipping and spraying equipment?—C. V. P. Co. (Chemicals & Equipment).

Information supplied.—ED.

Heat-Resistant Finishes

At your earliest possible convenience, please furnish me with the names of producers of heat-resisting finishes suitable for steam radiators. —G. B.

Information supplied.—ED.

Air-Motored Agitator

Will you please advise us who manufactures a compressed-air agitator suitable for agitating a 5-gallon can of lacquer enamel?—S. Co. Inc. (Fishing tackle).

Book on Enamel Hairlining

The Ferro Enamel Corp., Cleveland, Ohio, manufacturers of Ferro Porcelain Enamels, announce the publication of Technical Bulletin No. 6, entitled "Some Physical Properties of Sheet Steel Enamels Affecting Hairlining," by E. E. Bryant, member of the Ferro Research Staff. The Bulletin covers the results of an original

FORM - A - ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM - A - ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM - A - ROC

Baking schedule is of great flexibility, permitting from 5 - 50 minutes at 250 - 375° F.

FORM - A - ROC

No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

FORM - A - ROC

MADE BY

THE VARNISH PRODUCTS CO.

5208 Harvard Avenue

CLEVELAND, O.

PRODUCTION

CHROMATE

PRIMER

For streamline speed

- Air dries in 20 min.—Can be force-dried or baked.
- Forms perfect bond for lacquers or synthetics—no lifting.
- Excellent adhesion to all metals and die cast parts.
- Resists moisture penetration and salt spray tests.
- Supplied in different colors to suit your needs.

Will Finish Your Product or Supply Sample for Your Tests.

H. V. WALKER CO.

MODERN PRODUCTION FINISHES

Elizabeth, New Jersey

investigation carried out by the author and members of the Ferro Technical Staff, under the direction of Dr. G. H. McIntyre, Director of Research for the Ferro Enamel Corporation.

Discussions cover theoretical considerations of failure due to tension; enamel thickness; bisque-coat strength and the formation of coatings under hairline. Experimental procedures are described and various studies are illustrated.

Plastic Lense or Rivet for Metal

A new processed lense made from colored plastics has been introduced into the industrial market.

The processed plastic lense (or rivet) will permanently lock itself into metal forms upon the application of 150°F. for ten minutes. Plastic lenses are translucent and may be secured in many colors to harmonize with the manufacturer's product.

Readers of INDUSTRIAL FINISHING who are interested in securing samples, showing the expanding features of self-locking plastic lenses, may secure them without obligation by writing on their business stationery to the Expanding Sign Lense Corp., 1151 Mulberry Ave., Muscatine, Iowa.

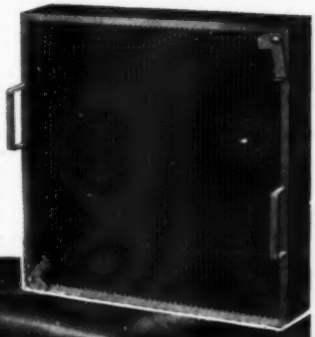
"Business Organization"

Suddenly increased activity in many industries has brought organization problems very much to the forefront of business thinking. Therefore, the new report, "Business Organization" which the Policyholders Service Bureau of the Metropolitan Life Insurance Co. (New York, N. Y.) has just issued should be of practical assistance to key executives faced with organization problems, whether company-wide or departmental.

The study is designed to assist in the initial planning of an organization set-up or its subsequent revision or review. The material is presented so as to make it applicable to companies of all sizes and to all types of activity. The report discusses basic types of organization, the subdivision of authority, the "span of control," centralization vs. decentralization and the place that committees occupy in the organization picture. More than half the report is devoted to a description of the organization plans of 20 representative companies given as case studies. The place of organization charts and manuals is considered and examples given.

AAF FILTERS FOR SPRAY BOOTHS

The American Sinuous Spray Booth Filters successfully eliminate serious maintenance problems by removing spray vapor from the exhaust air before it reaches the fan and ducts. Prevent reduced fan efficiency due to accumulation on fan blades; reduce fire hazard resulting from deposits in exhaust dust; and eliminate unsightly appearance caused by settling of spray vapor on outside walls. Write for Bulletin No. 244.



AMERICAN AIR FILTERS

Airmat Dry Filter

The Multi-Panel Automatic Filter (right) is recommended for larger drying room ventilation while in small drying rooms Airmat Dry Filters (left) are more practical. The use of proper ventilation in the drying room, bringing filtered warm air into contact with the finished surfaces and exhausting the fume laden air, accelerates drying. Write for Bulletins No. 230B and 240C.

American Automatic Self-Cleaning Filter

AMERICAN AIR FILTER COMPANY, INC.
Incorporated
710 CENTRAL AVENUE
LOUISVILLE, KY.

AAF FILTERS FOR FINISH DRYING

How well does the in
you're using, FIT YO

THE LILLY COMPANY
HIGH POINT, N. C.

he finishing material
IT YOUR requirements?

Finishing materials, like clothes, should be made to fit the needs for which they are to be used. There are some special and particular requirements involved in every job of industrial finishing, hence there is no such thing as a "cure all" finishing material for all jobs. Appreciating such individual needs we started years ago expanding our laboratory and research facilities so that we could develop and make "made to measure" finishes on a production basis.

Right now we are adding another floor to our present 2-story structure in Indianapolis and we have a complete, modern research unit operating also at High Point, N. C., with a third elsewhere, soon to be announced. We have the facilities and ability to formulate and build a finishing material that will BEST FIT your requirements.

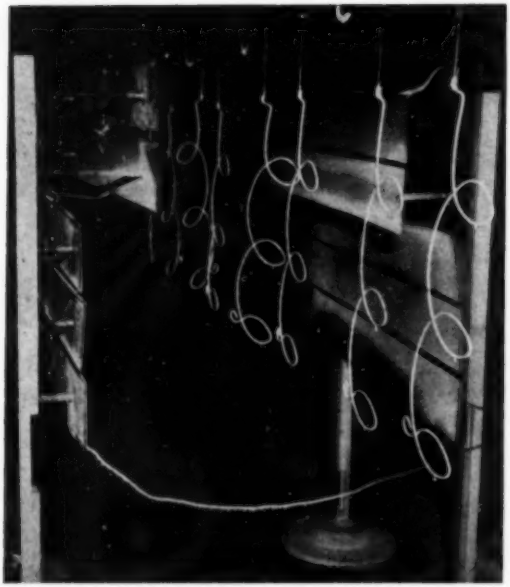
Y

LILLY VARNISH COMPANY

INDIANAPOLIS, IND.

Great Britain and Europe: Apply Jenson & Nicholson Laboratories, Stratford, London, England

Removes Paint Beads from D



Close-up view showing dip-enameled products entering and passing through high-voltage electric field (between parallel charged plates) wherein the last beads of enamel are repelled from points they cling to, and dispersed into the air in slender thread-like streamers. Most of this excess enamel falls to the floor mat; a small quantity of light particles lodge on whatever is near the charged electric field.

IN the new plant of Harper J. Ransburg Co., at Indianapolis, Ind., an outstanding, revolutionary development has been placed in operation in connection with a dip-finishing conveyor-oven unit. It removes what has been probably the most objectionable element to all dipping and flow-coating methods of applying paint, varnish or lacquer, namely, the presence of beads or tear drops and fat edges that cling to the lower edges of dipped work after the flow-down of excess material has stopped.

The solution of the problem, as worked out by Harold Ransburg, is much more simple than any mechanical method you can think of. The beads and fat edges form, but at the proper point along the conveyor line—at a point where the flow-down of one-coat enamel has substantially ceased—the articles pass through a high-voltage electric field. As soon as the freshly-coated products or parts enter this electric field, any drops or fat edges that remain are immediately repelled from the work with such force that the excess paint flies out into the air in small thread-like sprays and stringy particles. The thin film of coating remains and levels out smoothly, leaving no trace of the beads or fat edges.

Dipped Work Electrically

BY W. H. ROHR

The automatic removal of beads, tips or fat edges from dipped work gives a smoothed-out film of more nearly uniform thickness, prevents any paint drippings in hot oven, and makes practicable the use of a quick-setting, one-coat enamel that has excellent adhesion, remarkable toughness and fine color retention.

▼ ▼ ▼

The Ransburg Co. manufactures an extensive line of housewares which includes wrought-iron floor stands, wall brackets and window shelves. Most of these items are formed of slender iron rods, the designs consisting of sweeping curves, complicated bends and decorative scrolls. The finish on many of the articles is a one-coat white enamel.

For several years the company has directed considerable study and effort toward improving the quality of finish on this line and at the same time reducing the finishing costs. Dipping enamels were adopted which permitted the speeding up of production, but the formation of clinging drops to under edges necessitated added labor to remove these beads and patch the places from which they were removed. The expense of this "de-tearing" and patching was greater than that of wrapping and packing.

In an effort to reduce to a mini-

Partial view of conveyor and oven installation—with electric paint-bead-remover at the extreme left, where the light trail of paint drippings on floor mat ends abruptly.

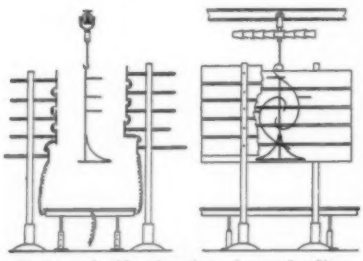
mum the formation of drops on under edges, the company tried using a very thin material with slow-evaporating solvents, such as xylol, high-flash naphtha, dypentine, etc. However, this brought the usual difficulty of leaving insufficient material on the top surfaces, while at the same time there was an over-abundance of material on all of the under portions.

"We have tried many methods of eliminating the obvious disadvantages so prevalent in dipping," Mr. Ransburg states, "and have had many of the best paint companies in the country work on this problem, without ever finding a material or a method of application that would meet our requirements of quality and high-speed production. In our search for a better dipping enamel we have always made it clear that price was not an object, if we could only find a material that would give us a higher quality finish. Consequently, we were paying a premium for the best material we could find for our work."

Characteristics of Enamel Used

The company is now dipping its products in a synthetic enamel that contains 15% urea, at a viscosity much higher than was formerly possible, and they are using much faster solvents than ever before. The synthetic enamel is being reduced in the proportion of seven parts of enamel to one part of thinner. This results in a rapid setting of the enamel and improves the hiding qualities of the finish on the top surfaces of the products. The present viscosity of the material, at 75° F., is 27 seconds on a No. 4 Ford cup, or 81 seconds on a No. 7 DuPont cup—which is considerably heavier than the usual viscosity of enamel used for dipping or spraying. In order to adapt this material to long pieces, the firm found it necessary to add a small amount of wetting agent. For this purpose they are using 2-oz. of butyl-carbitol per gallon of enamel.

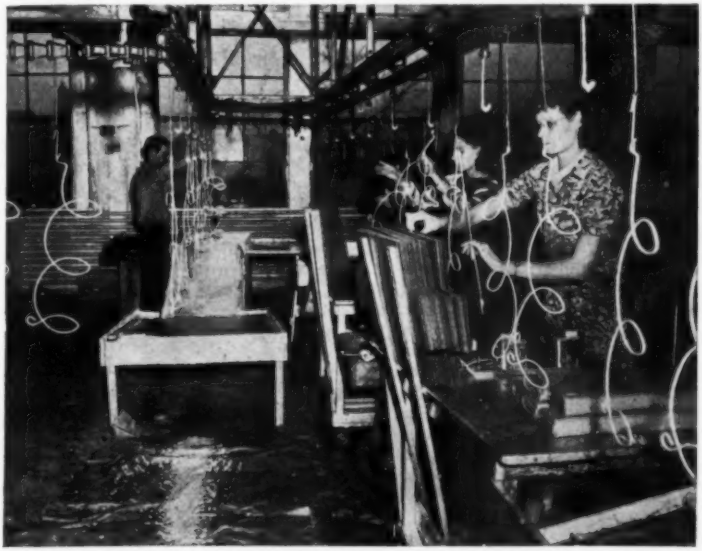
After being dipped, the articles are hung to hooks attached to an overhead conveyor. As they move forward they pass over an inclined drain board which catches the heavy flow-down that occurs immediately. Then they travel on for a sufficient length of time for the dripping of enamel to substantially cease. At this point they pass through the charged electric field where the beads and heavy edges are completely removed quickly, safely and economically. The time required between dipping and the electric treatment depends entirely upon the design of the product and the characteristics of the enamel.



Front and side elevation views of adjustable electrodes between and near which an electric field is provided. The purpose of this electric field is to remove clinging beads, tips, or heavy edges of enamel from dipped products, leaving no trace of same.

What Makes It Work

Illustrations in this article show clearly how the electric field is arranged and where it is located with relation to other equipment along the conveyor line. End and side elevation views of the charged plates or electrodes, between which the electric field is produced, are shown in the accompanying drawing. This drawing also shows the



View of conveyor loading and unloading stations. At the left the cleaned metal parts are being dipped into a tank of white enamel and are being hung to hooks hanging from the overhead conveyor. A drainboard follows, then paper floor mats, to catch the drips. Following the removal of all clinging beads, and the ten-minute trip through an oven (300° F.) the work completes its circuit or loop and moves to the unloading and packing station at the right, where girls pack the products as they remove them, thereby eliminating any extra handling. Thanks to the practical operating efficiency of everything in this unit, no touch-up finishing is required on any dip-enameled articles.

relative position of wrought-iron articles passing through the electric field. The electrode plates are, of course, supported by non-conducting rods and pedestals so as to insure complete insulation. They are also adjustable as to position and distance from the work passing through. By controlling the electrode distance and the voltage, the proper field intensity can be secured for the desired results.

The plates are charged, while the overhead monorail and metal parts hanging from it are grounded. The difference of potential between the articles hanging from the conveyor and the electrodes is usually 100,000 volts, direct current. The Harper Ransburg Co. has designed and built an oil-immersed power pack for creating the proper electric field. It requires less than 4-amperes at 220-volts in the primary, and is capable of giving from 72,000 to 126,000-volts in eight steps.

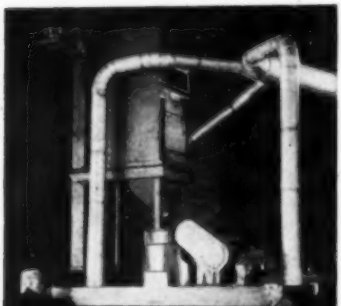
Having been carried through the electric field, wherein the clinging drops and heavy edges are removed, the work enters an oven and is baked ten minutes at a temperature of 300° F. Upon leaving the oven the work travels a sufficient distance to become cool enough for comfortable handling before it is

packed. As the work is removed from the conveyor, it is immediately wrapped and packed for shipment. No extra handling or touch-up work is required.

Summing up the tremendous benefits derived from the use of the equipment just described, Mr. Ransburg says:

"We now enjoy several important benefits from the use of this process. It has made possible the use of an enamel that gives us better hiding qualities throughout the article, has more toughness and adhesion, has better color retention, and is print-proof while still warm. It has made possible the reduction of our inspection and packing labor to at least one-third of its former cost. It has made possible the use of a material that requires only a 10-minute bake. And, last but not least, it has eliminated the dripping of paint in the hot oven, and the attendant fire hazard. We visualize this process as making it possible to dip many items on which, heretofore, a satisfactory finish could not be obtained by dipping."

Patents are pending on the apparatus and method of removing paint drops and fat edges, as described in this article, and this equipment along with engineering service will be available to the trade, according to Mr. Harold Ransburg, the inventor. This process is also effective on articles made of wood or earthenware.



Mechanically cleaning and smoothing metal castings with an "Airless Rotoblast Multi Table." Photograph, courtesy Pangborn Co.

H. L. Cook Joins Enamelers Guild Division of O. Hommel Co.

Mr. Herman L. Cook, widely known ceramic engineer and enameling superintendent, has taken a position on the staff of the Enamelers Guild Division of the O. Hommel Co., Pittsburgh, Penna. Mr. Cook's accomplishments in the furtherance of efficient porcelain enamel production are well known in the porcelain enameling industry.

In his new association, Mr. Cook will aid in co-ordinating new porcelain enamel frits developed by the Enamelers Guild Research Department and Laboratories, with the cooperation of the Hommel Industrial Fellowship at Mellon Institute, and manufactured in the O. Hommel Co.'s modern frit manufacturing department. He will also be available to assist, if possible, in any plant production or manufacturing problems pertaining to the porcelain enameling industry.

New Label Identifies Genuine Porcelain Enamel

The Porcelain Enamel Institute, Inc., 612 Michigan Ave., Chicago, Ill., announce adoption of a label which for the first time offers to buyers and their salesmen and customers a ready means of identifying "first quality" porcelain enamel.

The label will identify kitchen cabinet and table tops, and the tops of dinette and breakfast sets which are manufactured to meet the Institute's standards for resistance to abrasion, heat, and the chemical action of foods and cleaning agents, according to Charles S. Pearce, managing director of the Institute.

SUGGESTIONS ABOUT RECEIVING, STORING AND

Moving Drums of Material

Foreman finisher calls attention to both correct and wasteful practices in connection with receiving drums of material, inspecting same for leaks, storing the reserve material, getting material from storage room, handling and moving filled drums in the finishing room, conditioning contents before using, and observing reasonable precautions to make sure of real cleanliness and safety.

BY H. W. CHESTER

MUCH TIME and trouble can be saved by foreman finishers—and many times a lot of money can be saved by the company they work for — if proper storage space and handling equipment is provided for drums of finishing materials.

Finishing materials should be stored in a warm dry place, preferably in a small brick or concrete storage house separated and at some distance from the main plant. Drums, barrels and other containers should be stored in an orderly manner so that each kind of material can be easily reached when it is needed. They should always be positioned so the label on each container can be seen.

Materials in Storehouse

If drums or barrels of material are left outside, unsheltered, they are exposed during summer to the extreme heat which is occasionally harmful to such materials as sealers, lacquers and enamels, sometimes causing them to go out of solution. If they are exposed to the extreme cold during winter there will be changes in the viscosity of sealers, lacquers, varnish, etc., making them too heavy to spray properly—until after they have been warmed up to approximately 70°F. or more. Stains that have a high water content will often freeze and go out of solution when unprotected from real cold weather.

Sometimes, when wood barrels of material are stored outside, they are set on end; then, when it rains, water accumulates on the top ends and if the head bungs are not tight, some water may seep into the contents of the barrels, thus making the material therein unfit for use.

Of course, if an emergency arises wherein it is necessary to store some materials outside of the regular storage house, only those materials that will be least affected (such as varnish and thinners) should be put outside where they are exposed to the weather. Then, before they are used, these materials should be taken inside and placed in a warm room to bring the contents up to room temperature or to 70°F.

The storage house for finishing

material should be constructed of brick or concrete and, where possible, it should be heated in cold weather in order to keep the finishing materials at the right temperature so they will be ready for immediate use at all times.

Handle Drums and Barrels Carefully

When handling materials in barrels, the barrels should never be dropped if it can be avoided. It is always best to have the platform at the storage house and factory door on practically the same level as the floor of trucks or cars from which the barrels are loaded and unloaded. If it is necessary to drop barrels at some time, they should always be dropped so they will land on their bottom rims.

Care should be exercised in the handling of barrels and drums of material, especially if the materials are in thin non-returnable barrels; these are easy to burst and sometimes a whole barrel of material will be lost due to its bursting because of carelessness or rough handling.

All barrels of material should be carefully inspected when they arrive at the plant. Look for possible leakage caused by loose bungs and damaged places, as a lot of material can be lost from these causes.

Wipe Drums Clean

Drums, barrels and other containers should be carefully wiped clean on the outside before they are carried into the finishing room, as a considerable amount of dirt and dust, which has accumulated in shipping and handling the materials, can be carried into the finishing room this way. Then, too, if a man opens a barrel that is dirty on top, some of the dirt may get into the contents of the barrel thus, in some cases, making it unfit for use.

Thanks to the fluid pumps now available, many concerns now "shoot" their materials directly from the drums or cans, so large containers of the material must be moved around in the finishing room. Due to fire insurance regulations, we are not permitted to store any material in the finishing room, except what will be used during the day's production. We haul each day's supply by motor truck to our finishing room, as we plan, on the day before, just what we will need.

Transferring Drums of Material

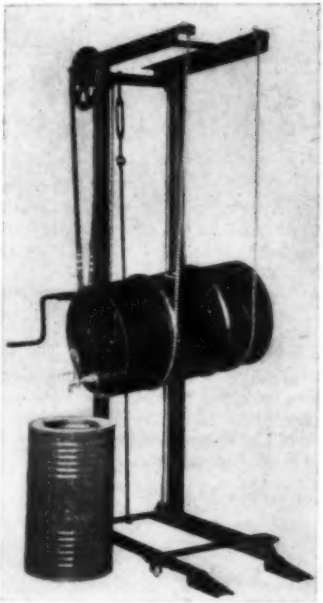
Inside the finishing room we transfer the filled drums and barrels to their proper stations with a low 4-wheel (ball bearing) dolly. Most of the barrels are placed in upright position on the dolly, but some of them have to be placed horizontally. When this is necessary we place bandsawed blocks on the dolly to prevent the drum from rolling. We transfer the loaded drums to each spray booth as they are needed.

Bungs on the barrels should always be kept closed and tight when the contents are not in use; an open barrel allows valuable solvents to evaporate. It also permits dirt and foreign matter to enter the barrel.

In regard to stains and other materials which, for different reasons must be drawn from the barrels a few gallons at a time, I would suggest that the platform on the dollies be built high enough to allow a 5-gallon container to be set under the faucet of the barrel; or a stationary rack can be built up against the wall to accommodate these barrels. We use the latter method. If a stationary rack

is used it should be in a place convenient for each station where the material will be needed.

NOTE BY EDITOR: Although many concerns are not yet using them, there are now on the market several safe, economical and labor-saving devices that make it easy for one man to tilt, lift, move and stack filled and partly filled drums of material. Two of these are shown in the accompanying illustrations.



Here is a standard portable drum elevator or hoist by which one man can easily raise a filled drum of material 6-ft. in the air. In use, it is only necessary to roll the full drum onto the skids, place a loop of the sprocket chain under each end and turn the crank. The crank can be transferred to either side, for right-hand or left-hand operation. If the drum is to be tipped for draining, one loop of the chain can be made longer by drawing it over sprocket.

This combination tilter, support and dolly enables one man to lift and transfer filled drums of material with ease and safety.

V. J. Dolan Expands

The offices of the V. J. Dolan & Co., Inc., 1830 N. Laramie ave., Chicago, have been enlarged and new laboratory facilities added recently. The company states that it is now in position to receive panels and sample pieces of furniture for demonstrations of the latest trends and developments in finishes.

R. E. Bonner Joins American-Marietta Industrial Finishing Division

Robert E. Bonner, for many years a well known figure in the paint industry in the midwest, has joined the American-Marietta Co. at Chicago, as a member of the company's industrial finishing division sales staff.

Mr. Bonner's background in the industry is long and colorful, and his progress has been singularly accelerated by his foresight and imagination.

Although he is thoroughly familiar with the sales requirements of finishes for all types of metal and wood, Mr. Bonner became interested in the very early days of broadcasting, in the possibilities of developing a highly specialized market for radio cabinet finishes. It is in this field that he has been outstandingly successful, his sales record probbaly exceeding any other individual in the business.

Mr. Bonner will continue to specialize in radio cabinet finishes in his new position, working directly under Muir Rogers, director of the company's midwestern industrial finishing division.

American-Marietta Company operates plants in Kankakee, Ill., Marietta, Ohio, and High Point, N. C.

I have worked in a number of factories and find there is a demand for color patchers, but it also seems to be a lost art. Here in Grand Rapids, one company in particular has nine color and burn-in patchers. All this work is done after the furniture is rubbed.
In my own particular case I handle approximately 300 table radio cabinets a day. These I touch up with alcohol stains, burn-in the necessary holes, and color patch the "rub-throughs," blemishes, etc. There may be other methods faster but I don't know what they are.—

Emerson C. Martin

The Art of Color Patching

AN EXPERT repairman is an essential figure in any finishing room, as he can reduce the number of rejects that have to be stripped and recoated. No matter how carefully production finishing operations are watched, a certain number of rejects will come to the final patcher. Some of these may be "rub-throughs"; others may have stain or filler spots.

I have had rejects come to me with "sand-throughs" in the veneer that had been run completely through the finishing room. After these have been rubbed, it is quite costly to send them back to be recoated, as rubbing alone constitutes a large portion of the finishing cost.

I will try to convey to you my method of repairing these blemishes.

Spirit Aniline and Earth Colors

Red Lead	Spirit Black
Litharge	Spirit Red
Burnt Umber	Spirit Yellow
Raw Sienna	Spirit Brown
Raw Umber	French Ochre

With these colors, any shade or hue can be produced. The spirit colors will give a clearer depth of color, but they lack the opacity of the earth colors.

Other materials needed include French varnish (refined bleached shellac), mineral oil, ether varnish or an amalgamator, and a supply of clean white rags that are soft, have a close weave, and are entirely free from lint. These rags should be cut in sections measuring at least 6x6-in.

Coloring a Blemish

Anyone can become quite adept at color patching by practicing until he learns the "feel" of the finish. We will start out by repairing a "rub-through," which is a common thing in any finishing room. Make a padding with a rag free from wrinkles and place it on your index finger. Pour a drop or two of French varnish on the padding; then a drop of oil; rub in circular motion on bench, as a reaction of the oil on the French var-

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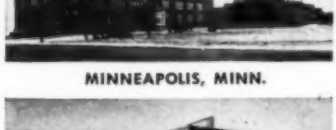

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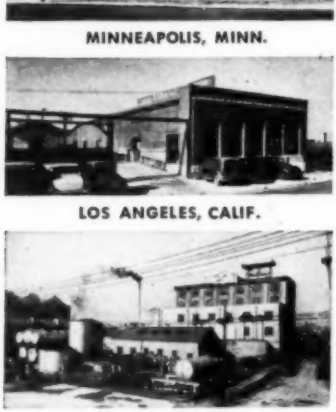

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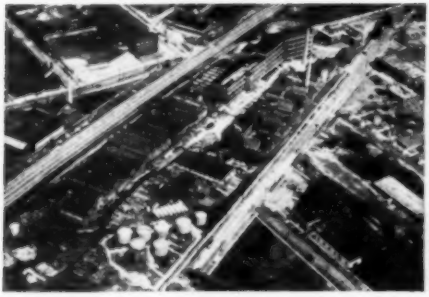

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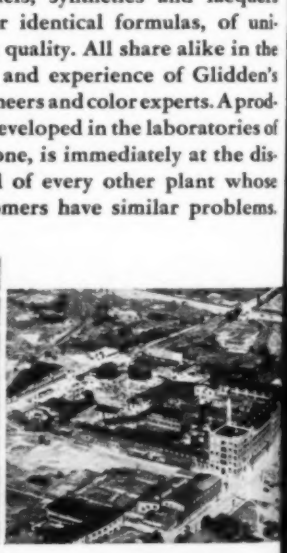

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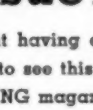
New developments in finishes that have passed the laboratory stage and have been proved by tests to be all that is claimed for them, will be reviewed in this issue. It will be thorough and practical in its editorial treatment, and will prove a handy reference book throughout the year. Don't fail to get a copy.

ADVERTISING VALUE, TOO

The fact that this Annual Edition will arouse unusual interest, affords a splendid opportunity for manufacturers to point out the merits of their finishes and equipment. Display advertising is a good avenue of approach to potential customers. Make arrangements NOW for an attractive, sales-stimulating ad on finishes, or finishing equipment and supplies.



Industrial FINISHING

222 East Ohio St.
Indianapolis, Ind.

nish cools the pad and makes it more easily worked. Go over the "rub-through" four or five times until the working surface is built up.

Dip the fingers of your opposite hand in the various colors and blend them until the proper color is obtained. Smooth color on and work it into the finish with the French varnish. After the proper color is obtained, go over the patch with more French varnish until a protective coating is applied. Let the surface dry a few minutes; then go over with ether varnish or an amalgamator, which will form a hard surface and will not show a lap at the edges, as it blends in with the remainder of the finish.

Common Troubles

When too much French varnish is applied, and not enough oil, it will drag on the surface and take too much color. On the other hand, the use of too much oil will make it slick over and not take color. Consistent practice will enable one to judge the amount of each and turn out perfect patches.

The repair of a veneer "sand-through" is more difficult. After obtaining the proper color of a "sand-through," it is necessary to grain the patch so that it will blend with the remainder of the finish.

Often it may become necessary to recoat a patch. When this is done, the patch should dry thoroughly, for too quick a coating will cause hair-line checks. Varnish or lacquer can be used for recoating, as a color patch is compatible to either one.

Supplementary Remarks

I once held a finish repair job in a novelty table plant that used a varnish finish. The system of repairing there was entirely different. Those tables, after being inspected by the packers for defects, were returned to be fixed.

There was a small spray booth and, using different shading stains, the white spots and edges were spotted in. Where recoating was necessary we used ether varnish, which was sprayed on at low air pressure, as it set up and dried rapidly.

These methods were successful to a certain extent but we had many tables that had to be stripped and refinished. I realize now what could have been saved if we had understood color patching and "frenching-in."

Breaking in a color patcher can be done as quickly as training a man for other jobs in the finishing room. The main thing is for the beginner to learn the base colors and what they will do.

New Wood Finishing Book

A new book entitled "Practical Wood Finishing," by A. B. Pattou, co-author of "Furniture Finishing, Decorating . . . . " and copyrighted in 1940, contains 112 pages, 5½x8-in., of valuable uptodate information about wood finishing—particularly the various phases of furniture finishing.

Here is a clear easy explanation of the technique of finishing fancy veneers, inlays, rare and fancy woods in their natural colors; staining, filling and bleaching, as well as varnish, enamel and paint finishing; finishing with a spray gun; and dozens of other practical wood finishing subjects. Two entire chapters are devoted to novelty finishes such as blond, pickled, frosted, bone white, dusty antique, old world, polychrome, and 2-tone finishes. The book explains colors and color schemes; the use or harmonizing and contrasting colors; includes complete section on furniture repairing and refinishing. Four pages of 32 different foreign and domestic woods are illustrated in their natural colors. Also 85 additional illustrations.

The book is bound in a stiff cloth binding of dark blue, lettered in black, and sells for only $1.25. Copies can be obtained from this magazine.

Finishing Machine Tools

Describing and illustrating how the work progresses, starting from rough foundry castings and ending with the smooth streamlined glossy surfaces which are characteristic of these high grade machine tools.

BY F. A. WESTBROOK, M. E.

THE CAST IRON parts of machine tools—that is, with the exception of those areas that are machined and left bright—are given a finish that involves much more than just "a couple of coats of paint." The surfaces of castings, as they come rough from the foundry, are subjected to extensive scuff grinding to cut down the high places and rough edges; they are filled and puttied to build up low places; and sanded smooth; then there is more filling, more sanding, one or more sealer coat applications, and finally the one or two coats of durable machinery paint to produce that showroom finish which is characteristic of high quality machine tools.

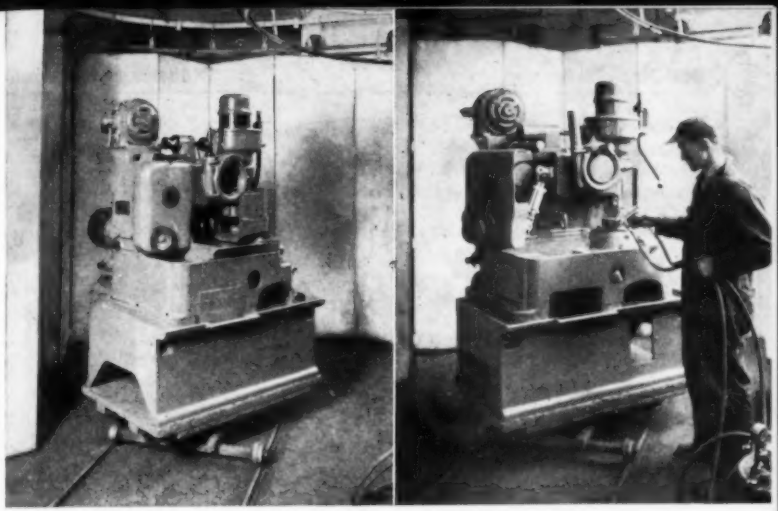
Hand sanding the spot-puttied places.

Really, to transform the rough surface of an iron casting into a stream-lined contour as smooth as though it were formed like an automobile body, calls for the expenditure of much labor and the use of modern equipment and supplies — plus large quantities of fine quality finishing materials properly applied.

Machine tools manufactured and sold by the Fellows Gear Shaper Co. of Springfield, Vt., are high quality products, shipped to all parts of the world, therefore they are given a smooth durable finish in lustrous machine tool gray. A complete finishing system has been worked out which gives these machines their excellent appearance.

In the first place, the rough foundry castings are given a preliminary cleaning and smoothing to remove all loose sand and scale. A portable grinding wheel is used to cut down "sprues" and other projections. This operation is called "snagging." It calls for skillful patient work on the part of workmen using portable grinding wheels. The castings are sprayed with a liquid cleaner and carefully wiped to remove all traces of grease, oil, grinding dust, shop dirt, etc.

A coat of filler is sprayed on to start the actual painting job. The



Compare these two pictures carefully and you will see, where the operator is spraying, that certain small parts are carefully and ingeniously masked to shield them from paint.

brand of filler used at the present time is thinned in the proportion of 3/1, filler to thinner. The viscosity of material most suitable for this work is specified by the company supplying the filler, and it is further proved by long experience to be satisfactory. This first coat of filler is used more or less as a guide coat, so that the operator can easily see any irregularities and depressions in the contour of the casting.

When the first filler coat is thoroughly dry — within approximately 30 minutes, under shop temperature conditions that vary more or less—the low places are glazed or puttied. Workmen apply this glazing putty or knifing filler, with a wide spatula knife or a piece of leather (see page 13, Sept. 1940 issue). This operation is performed to build up the low places to the highlights of the casting, so that the entire surface will be smoothly streamlined in general contour.

The applied knifing filler must become thoroughly dry before it is sanded. The entire surface is carefully sanded with No. 120 abrasive paper. If the work, up to this point, has been carefully performed and if all other conditions, including the materials, have been satisfactory, then there is a perfect foundation for the paint job.

The final coats of filler are now sprayed on. Generally these include three successive sprayings, one following the other at short intervals. This filler, like that used for the first coat, is thinned in the ratio of 3/1, filler to thinner. Then follows an overnight drying. Next morning the surfaces are carefully sanded smooth with No. 80 or 120 sandpaper. The filler is then protected by spraying it with one coat of National Machine Tool colorpigment sealer thinned to the proportion of 3/1, sealer to thinner.

The inside parts of all castings are cleaned and sealed to prevent free sand from being carried with

the oil from the automatic lubricating system to the bearings of the machine. This is accomplished by spraying the inside parts with two coats of crankcase white, the brand of material used being thinned 50/50 with thinner. The casting is now ready for machining.

When the castings have been machined, the tool is assembled and tested, after which it is ready for the final painting operations. During testing operations the castings are subjected to bumps and their surfaces become soiled with considerable oil and dirt, consequently the first operation, after the machine has been passed along from the testing line, is to wash it down with cleaner.

All dents, holes or scratches (resulting from handling during machining and assembling) are filled with a non-shrink spot putty. When sufficiently dry—within approximately three to four hours—the machine surfaces are smoothed with No. 120 abrasive paper.

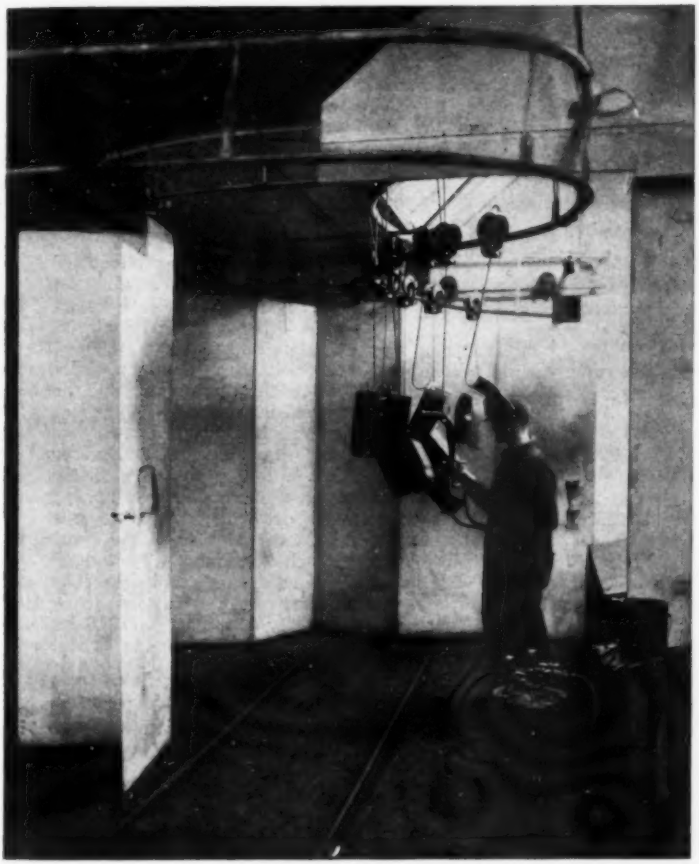
All bright metal parts are coated with "Slushol," and the entire machine is sprayed with one coat of sealer. Following this treatment, the machine is carefully examined again for any imperfections that may still show. If any are found, a second spot-puttying takes care of them. When this spot puttying has dried (after about three to four hours) the machine is again sanded, this time with No. 150 sandpaper. Another spray coat of sealer is given, followed by an additional touching up if it is needed. The machine is now in condition for final painting.

Spraying filler on a cleaned casting.

Snagging rough castings with small grinder.

The final spray painting consists of two coats of the standard N. M. T. gray. This lacquer enamel is mixed in the proportion of 40 parts of lacquer to 60 parts of thinner. No polishing or other operations follow this final spray painting. Small parts, such as guards, etc., are suspended from a monorail supported from the top of the spray booth. The whole arrangement is designed for convenience, efficiency and safety.

The slush is left on the bright metal parts of the machine, and the paint is applied over it. This



Small parts are sprayed while suspended, as shown, by carriers on an overhead monorail.

protects the bright parts from rusting during shipment. In many cases, sheet-metal guards or masks are placed over parts which are not to be painted; this shields them from the spray coats.

In the spray work, particular care is taken to make sure that the compressed air is clean (free from oil or water) and of adequate pressure to properly atomize the materials used. Also, it is important that the spray gun is always in excellent condition, and that it is handled expertly by an experienced spray operator.

Shellac Information

"Inasmuch as many of your readers probably use shellac in finishing operations, I am submitting this article on shellac solutions. The information revealed is, I believe, quite different from any you have seen on the subject and it should provide some very interesting and useful facts for users of shellac." —The Author.

BY FRANK J. MANNING

BY COMMON usage shellac solutions are designated according to their "cut." This term indicates the weight of dry shellac added to one gallon of alcohol. For example, a "4-lb. cut" shellac is prepared by using 4-lbs. of dry shellac to each gallon of alcohol. The cut of a shellac, however, tells little or nothing directly about the characteristics of a gallon of the material.

When dry shellac is added to alcohol there is, of course, an increase in volume over the volume of alcohol used and each gallon of solution contains somewhat less dry shellac than is indicated by the "cut." To illustrate this, a "4-lbs. cut" shellac contains, not 4-lbs. of dry shellac, but less than 3-lbs. per gallon of solution.

This data on alcohol solutions of shellac will, I believe, be of interest to many readers of this publication. The accompanying chart shows, for example, that a "3-lb. cut" weighs approximately 7.54-lbs. per gallon, contains 2.31-lbs. of dry shellac (30.61% by weight) and 0.769 gallons of alcohol per gallon, and will cover 369-sq.ft. to a thickness of 0.001-in., if the film is uniformly applied and no material is wasted.

It is interesting to note from the table that as the cut increases, the amount of actual dry shellac per gallon of solution does not increase proportionally. In other words, a 6-lb. cut does not contain twice as much dry shellac as a 3-lb. cut.

The data given in the chart are based on calculations using the density of alcohol as 0.815, and the density of dry shellac as 1.200.

Modifying Shellac Solutions

In some instances it is desirable to change the cut of an existing shellac solution, that is, to either decrease or increase its dry shellac content. In the former case, the quantity of alcohol required to change a shellac solution from a higher to a lower cut may be found from the formula:

$$A = \frac{Wh - Wl}{Wl - Wa}$$

Wh represents weight (in lbs.) per gallon of available heavy-cut solution.

Wl is weight (in lbs.) per gallon of desired light-cut shellac solution.

Wa is weight per gallon of alcohol (average approximately 6.80 lbs.).

A is volume (in gallons) of alcohol required per gallon of heavy-cut shellac solution to obtain light-cut shellac solution.

EXAMPLE: It is desired to reduce a 4.25-lbs. cut of shellac solution to a 3.50-lb. cut. Determine the volume of alcohol that must be added to each gallon of 4.25-lb. cut to obtain the lighter cut. Taking values *Wh* and *Wl* from the table:

$$A = \frac{7.76 - 7.63}{7.63 - 6.80} = 0.157$$

gallons of alcohol.

To determine the amount of dry shellac necessary to change a low-cut shellac solution to one of higher cut, use following formula:

$$P = \frac{10(Wh - Wl)}{10 - Wh}$$

Wh represents the weight (in lbs.) per gallon of desired heavy-cut shellac solution.

Cut (lbs. per gallon)	Wt. in lbs. per gallon	Wt. of solids per gallon	% of solids per gallon	Amt. of solvent per gallon	Cover. in sq.ft. per gallon
1.00	7.08	0.91	12.85	0.909	146
1.25	7.15	1.11	15.50	0.889	177
1.50	7.21	1.30	18.05	0.870	208
1.75	7.27	1.49	20.50	0.851	238
2.00	7.33	1.67	22.78	0.833	267
2.25	7.38	1.84	24.91	0.816	294
2.50	7.43	2.00	26.90	0.800	320
2.75	7.48	2.16	28.95	0.784	346
3.00	7.54	2.31	30.61	0.769	369
3.25	7.59	2.45	32.22	0.755	391
3.50	7.63	2.59	33.83	0.741	413
3.75	7.67	2.73	35.44	0.727	435
4.00	7.72	2.86	37.04	0.714	456
4.25	7.76	2.98	38.38	0.702	476
4.50	7.80	3.10	39.71	0.690	495
4.75	7.83	3.22	41.04	0.678	514
5.00	7.87	3.33	42.37	0.667	532
5.25	7.91	3.44	43.50	0.656	549
5.50	7.94	3.55	44.63	0.645	566
5.75	7.97	3.65	45.76	0.635	582
6.00	8.00	3.75	46.88	0.625	598

Further explanation of headings: The first column in the above table designates the "cut"; in other words the number of pounds of dry shellac dissolved into one gallon of alcohol. Naturally, the addition (by mixing) of one or more pounds of dry shellac to one full gallon of alcohol produces more than one gallon of material, therefore a gallon of the mixed material contains slightly less than the number of pounds of solid shellac "cut" into a gallon of alcohol; also the gallon of mixed material contains slightly less than one gallon of alcohol—all of which accounts for the odd figures in columns three and five.

Column No. 4 indicates the percentage (by weight) of solids (dry shellac) per gallon of mixed material.

The last column (the one at right) indicates the number of square feet that one gallon of mixed shellac will cover, giving a coating that measures 1-mil. (.001-in.) in thickness.

Editor's Note: Referring again to the figures in columns two and four, these differ slightly from the figures shown in the Shellac Mfrs. Assn. book entitled "Official Methods of Analysis." However, this difference may be accounted for by the fact that the author has based his computations on the approximate specific gravity of alcohol and of shellac. No account is taken of temperature and, of course, at higher temperatures the mixed shellac will expand and weigh less per gallon. Figures shown in the "Official Methods of Analysis" have been calculated at a temperature of 60°F., and the weight per gallon of alcohol has been taken at 6.78-lbs.

Wl is the weight (in lbs.) per gallon of available light-cut shellac solution.

P is the weight (in lbs.) of dry shellac required per gallon of light-cut shellac solution to obtain heavy-cut shellac solution.

EXAMPLE: Determine the weight of dry shellac necessary to change one gallon of 3.25-lb. cut shellac solution to a 5.50-lb. cut. Values for *Wh* and *Wl* are taken from the table.

$$P = \frac{10\ (7.94 - 7.59)}{10 - 7.97} = 1.70\text{-lbs. of dry shellac.}$$

Rubber for Paint

INCREASING commercial significance of chlorinated rubber demonstrates well the remarkable inertness and stability which chlorine imparts to some organic compounds, including the "Arochlors" (chlorinated diphenyl plasticizers) and the "Halowaxes" (chlorinated hydrocarbon waxes). Commercially, rubber is chlorinated by treatment of a carbon tetrachloride solution of pure crepe rubber with gaseous chlorine for several hours. The resulting product, a granular thermo-plastic, contains 66% to 68% chlorine.

To date, chlorinated rubber has been used chiefly in lacquers other than nitrocellulose, varnishes, printing inks and other finishes to impart corrosion resistance and overcome tackiness, brittleness and instability.

Generally speaking, chlorinated rubber is used in protective coatings in three ways: First, as a major ingredient of lacquer to which plasticizers, resins and pigments are added as required. A hard, flexible, stable, chemically resistant film is produced which is used for finishes indoors and outdoors, on hardware, for marine finishes, paper coating and cloth coating. Such finishes are particularly applicable for concrete surfaces because they dry rapidly and resist alkali.

Second, a small percentage of chlorinated rubber (5% to 10%) is added to other finishes to speed drying, improve gloss and resistance to chemicals.

Third and most important, the majority of all chlorinated rubber is consumed in mixture with long-oil alky synthetics, where addition of 25% chlorinated rubber is said to cut drying time in half and produce alkali-resistant, tint-retaining synthetic finishes suitable for wide industrial applications.

Although high cost has thus far restricted its use, the properties of chlorinated rubber suggest future application in outdoor adhesives to impart waterproofness, in printing inks to impart resistance to alkalis (necessary in soap wrappers) and in insulators to decrease water absorption. Mixtures with thermosetting plastics have been successfully injection-molded in experimental procedures and show high resistance to water, alcohol and other destructive influences.—*Industrial Bulletin.*

New Book on Spraying Now in Printer's Hands

Mr. Fred'k M. Crewdson, 228 Pierpont st., Rochester, N. Y., announces that he has written a book entitled "Spraying, Industrial and Commercial," which will soon be published. Mr. Crewdson has been a regular reader of Industrial Finishing for more than twelve years and writes that "it has been invaluable to me during these years in my work as a finisher."

Metal Finishing Troubles

BY MEYER ROTOR

When our brass products, finished in clear lacquer, suddenly started to tarnish after only a short time in service, we began a long investigation to find out why. Our new degreaser had something to do with it, but we kept right on searching and learning. Eventually we found the cause of our trouble and were able to remedy it satisfactorily.

SOME TIME ago we had considerable trouble with polished brass work that had been lacquered and sent to our customers. After about six months our beautifully lacquered brass products would be returned badly tarnished.

In our factory the brass work went through the following operations: It was cut down, washed in a modern degreaser, colored up, and then lacquered with clear lacquer. Sometimes it would tarnish in two or three months after it had been sent out.

We considered several possible causes in our efforts to find a remedy. We even referred the matter to others who had had experience with similar work We received numerous suggestions and recommendations. It was this information, along with some other leads, that enabled us to verify and establish to our own satisfaction, the causes of our tarnished brass.

Different Kind of Discoloration

For several months we made various tests on this problem in an effort to determine the causes and find out what could be done to remedy the condition. To start with, we learned that this discoloration of the brass was entirely different from that which is caused by the spotting-out of plated work, or from the acid presence that shows green and red corrosion spots. The former is caused by the absorption of alkali solution into porous metal that has been electroplated. This shows up in white and brown spots two or three days after the work has been lacquered.

The second condition of acid-caused spots may be the result of acid that has been trapped inside tubing or pocketed recesses of work that has been acid dipped. These parts, not being rinsed well enough in water, hold the acid until the corroding effect finds its way out after the parts have been assembled. Even soldering acid, not rinsed and dried well enough, will afterwards give the green acid corrosion spots.

The tarnishing effects that we had experienced—the tarnishing of polished brass several months after the work had been lacquered—

was not brought about by any of these causes.

The first question that came up was, "Why is it that none of the work lacquered two and three years ago, became tarnished like that which had been lacquered only eight months ago?" During all of that time the same lacquer had been used on all of the work.

Attention Directed to Degreaser

About two years ago we installed a degreasing machine, and our trouble seemed to date from then on. Now I don't want to be misunderstood as condemning this splendid machine, as I have found it gives us an efficient and time-saving cleaning process. I merely wish to point out that the condition it presents, in cleaning the metal, is the iron test for a good lacquer.

Clear lacquer for bright metal must be of good body to stand up properly. In spite of all that can be accomplished by the degreaser, there are some men who would probably discard it—simply saying that it's impractical; not attempting to solve their problem by getting to the root of their trouble. At this phase of the problem, I wish to bring out the factors that must be controlled in order to get the best results in cleaning with a modern degreaser.

Facts We Discovered

In studying our problem, we observed the following facts: As long as our lacquered brass fixtures remained packed in stock, they seldom showed any noticeable tarnish. The tarnished fixtures that were returned had the greatest amount of tarnish on the exposed areas of the fixtures, while toward the shadowed areas the tarnish lightened up into the retained original brass color. This indicated that tarnish started where the parts were exposed to light and heat. In other words, the lacquered surfaces were in an active state for oxidation and only needed the catalysis of light and heat to get it started.

We also observed that work that had been lacquered at certain times would tarnish more than other work done at other times—this judged, of course, by the same period of exposure. At times we would get badly tarnished brass that had been exposed only a few months. Judging from the peculiar mottle of the tarnish and its occurrence, we finally traced it down to the days of very damp weather in which the work had been lacquered. The mottle probably was the after-effect produced by the retarder that had been sprayed on blushing lacquered work (the lacquered surfaces which had turned white).

The Degreasing Process

Now let us see what takes place when the work is cleaned by the degreasing process, with the grease solvent known properly by the chemical name, "trichlorethylene." Although this cleaning material is a stable compound, if its molecules should be broken up its atoms would unite in part, into its simpler formula of hydrochlroic acid. This would take place in the presence of water. Actually it does take place in minute amounts during damp weather.

The vapor of the boiling grease solvent mixes with the water vapor of the air. Evidently some of these molecules do break up during the boiling action. as tests would prove. Even a slight trace

of acid has a detrimental effect on the metal's surface. A simple proof that this actually does occur is as follows: After having cleaned a great deal of brass or copper in the machine, insert a piece of zinc or die casting into the machine for half an hour. When you withdraw the zinc you will find it coated with a film of copper. You have actually reproduced the electrolytic action of a battery because of the presence of acid in the grease solvent.

Where Actual Harm Occurs

This brings to our attention still another condition that is the cause of a great deal of trouble in cleaning polished brass work. If the cleaning material becomes contaminated with foreign matter, such as oils and polishing material, the cleaning process will leave the surface of the work in a worse condition than before it entered the degreaser. This condition is not always visible because it is a film of sulphide or some other oxidizing material that shows its tarnishing effect long after the work has been finished and lacquered.

Without going further into detail of the proofs of the action of these conditions, I will conclude with the steps I recommend for the control and elimination of these troubles.

Revised Degreasing Methods Removed Our Trouble

First, we will assume that the degreaser we are working with has one compartment for boiling grease solvent. This compartment is the one in which the greasy and dirty material is dipped first. Then we have a compartment of clean cool grease solvent for rinsing the work. We also have a chamber for the vapor which is caused by the boiling material.

When brass has been cut down with tripoli, rinse the work only in the boiling grease solvent, drawing it through the vapor chamber when taking it out. Don't keep the work in this boiling material any longer than necessary. Agitate the work during the process to quicken the action of freeing the dirt from the metal. After this procedure, buff the work with a clean cotton buff, using a polishing composition to bring it up to a highly polished surface. If the metal so polished has a clear clean surface, without any recesses, it may be wiped with a clean dry cloth to remove any dust particles. Then it should be immediately lacquered.

Some Work Needs a Second Pass Through Degreaser

Work that has intricate ornamentation, in which even the polishing composition collects, must be run through the degreasing machine again. In this second cleaning operation I recommend that it be run through only the cool clean rinse of grease solvent; then draw it through the vapor. By this method of working, the possibility of depositing a detrimental film is practically eliminated. The grease solvent material must be distilled as soon as the amount of work cleaned has caused the material to become too dirty to work with. It may be a matter of every few days, or every few weeks, depending on the volume of work cleaned.

Other Things We Learned About Degreaser Operation

In any case, large quantities of oily material should not be cleaned in the machine during the same time that polished brass is cleaned.

Either have a different machine for this type of work, or save the oily steel or brass work until you are ready to distill the grease solvent. Then you can clean it without running any other finished work that might be harmed. The greatest difficulty (and one about which very little can be done) is the operation of the machine in very damp weather, when polished brass has to be cleaned and lacquered.

Of course, this trouble is not experienced in an air-conditioned room or with steel articles that are cleaned for enameling. The only trouble that can be experienced with steel is when it is allowed to lay around a few days (after it has been cleaned) before it is sprayed. In that case the active metal rusts very readily. Water enters into the grease solvent by the sweating of the cooling coils and by the dampness in the air.

Cutting down the water flow through the coils will bring the temperature of the cooling system into closer relation to that of the grease solvent, thereby reducing the sweating possibilities. Degreasing machines are now equipped with water separators, a device so arranged that it will remove the water present during the distillation process. This is done by reason of the water being lighter and always going to the top of the solution. A little dipper can be made to skim off the water in the solution by attaching a cloth or shammy to a long-handled frame.

But, all in all, it's the quality of the lacquer that is the most important factor. With the change to a good grade of lacquer we have overcome the blushing condition during damp weather. This, supplemented by careful control of the cleaning process in degreasing, has enabled us to overcome the tarnished condition we experienced on polished brass work.

Degreaser Manufacturer Offers Additional Comments

EDITOR'S NOTE: The following comments are submitted by G. S. BLAKESLEE & Co., manufacturer of parts washing machines in which trichlorethylene is used.

We believe that the new lacquer which Mr. Roter uses to prevent the tarnish is one which has a low hygroscopicity and forms a moisture-impervious film on drying. We believe we can throw some light on the problem from solvent degreasing angle, as this problem has been brought to our attention several times.

Mr. Roter writes about the effect of moisture on solvent decomposition and consequent generation of hydrochloric acid. If he is using a standard unadulterated, degreasing grade of trichlorethylene, there will be no perceptible increase in the rate of decomposition because of an increase in moisture content. This solvent is quite resistant to hydrolysis. The only hazard of high humidity is in the tendency of "sweating" at the cooling coils. Any chlorinated hydrocarbon will, particularly at its boiling point, generate HCl gas. If the solvent is not unduly wet and if the cooling coils are dry, this gas will pass off into the atmosphere and have no effect.

Excessive moisture forms a storage or accumulating means for the gas, which dissolves and forms hydrochloric acid solution. We have found that droplets of water on the cooling coils can develop a very high concentration of hydro-

chloric acid, which not only causes corrosion of the coils but dissolves stabilizers out of the solvent, and also increases the rate of decomposition of the solvent. In our degreasers, we have sufficient cooling surface to allow for an outlet water temperature of 110° to 125°F., which will keep the coils above the atmospheric dew-point and prevent "sweating." The generation of HCl gas has not been found to affect the solvent, the tank, or the work being cleaned in the absence of excessive moisture.

Copper Plating of Zinc

Copper plating of zinc, as proof of acidity in the solvent, is rational but incorrect. If HCl were present to any extent, it would form $CuCl_2$ which is insoluble in the solvent and would precipitate out. We have found that copper plating of zinc occurs most readily when the solvent is definitely alkaline. If the solvent is more than just saturated with water, $Cu(OH)_2$ is formed which, in turn, reacts with one of the stabilizers to form a soluble copper ammonohydroxide which is unstable to heat and decomposes to give free copper on the zinc.

Another possibility is the formation of fatty acid salts of copper which are soluble in the solvent. This, however, requires a rather anhydrous condition of the solvent and is therefore not very likely to take place.

Degreasing in Polluted Solvent

The statements concerning the degreasing of polished brass in polluted solvent check with our findings. We have run into this problem most often in cleaning buffing compounds off the work. In spite of a rather violent boiling in the dirty or first compartment, there is a definite tendency for the tripoli, which is about 70% of the stick, to settle on the bottom of the tank. The stearic acid used as a bond in the stick combines with the stabilizer, and is adsorbed on the tripoli. Some of this complex coats on the work and not only prevents cleaning, but in some instances makes cleaned work dirty. This is also one of the causes for the loss of stabilizer. We have got around this difficulty in the following manner:

The third or vapor compartment is provided with heat at the bottom and the dirty solvent from the first tank overflows into it. The solvent is continuously distilled out of the vapor tank and returned to the middle or rinse tank which, in turn, overflows to the first one. In this way, the pollution is accumulated in the vapor tank where it is out of contact with the work. By placing soda ash or lime in the vapor tank, the stabilizer is reliberated from the stearic acid complex and returned to the liquid tanks. In order to take care of the pollution which settles to the bottom of the first tank, we recommend the intermittent drawing of solvent from the bottom of this tank, either to the vapor tank or to a still. By this arrangement, buffing compounds can be removed from brass or zinc die-cast parts with little difficulty.

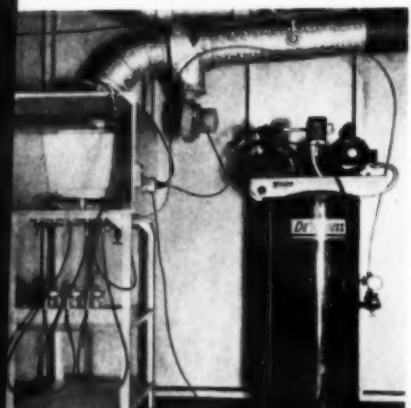
For Touch-up Work and Refinishing

A NEW TREND in evidence among some of the large manufacturers that have national distribution through their own retail sales divisions, is to equip

their service departments with what is needed for repairing or touching up the finish of damaged products and for completely refinishing products that are taken back in trade, reconditioned and resold.

The equipment being installed for this service is of modern type —efficient and economical in operation. This modern way now prevails in the more progressive organizations. Up-to-date precision tools and methods are being used and the best of skilled workmanship is employed so that all such jobs can be more thoroughly and more quickly turned out.

Typical of this new order is the policy adopted by The Hoover Co.'s service department, an important unit of the company's sales division. Each year this department of each of the many sales branches of The Hoover Co. reconditions thousands of Hoover cleaners, restoring them to a condition comparing favorably in performance and appearance with the newly built cleaners.



The Hoover Co. recently provided each of its factory branch service stations with the latest type of equipment necessary to refinish all enameled parts and clean the motors of the cleaners.

This equipment includes spray guns and dusting gun, air compressor, spray booth and related parts. It is well suited to the work of improving the appearance of the users' cleaners, which are brought in for service, and is particularly adapted to restoration of the particular wrinkle finish on the cleaners.

Service department executives of The Hoover Co. say the investment in this extensive installation is relatively small in the light of the return effected through the resulting customer satisfaction. The company is enabled to not only do a reconditioning job more thoroughly and completely, but much more quickly as well, earning for its service organization a reputation which distinguishes it in the industry.—M. & F.

Agencies to Sell Castor Oil

Mr. J. E. Good, V. P. and Sales Manager of Woburn Degreasing Co. of N. J., Harrison, N. J., announces the appointment of several new agencies for the sale of fatty acids and Isoline (dehydrated castor oil). They are as follows:

C. L. Hueston, Detroit, Mich., covering Detroit and Lower Michigan.

J. C. Ackerman, Pittsburgh, Penna., covering Western Pennsylvania and Northern West Virginia.

Nolte Brokerage Co., St. Louis, Mo., covering the State of Missouri.

C. M. Durbin Co., Cincinnati, Ohio, covering Cincinnati, Louisville, Indianapolis, and Dayton, Ohio.

Oscar J. Friend & Co., Minneapolis, Minn., covering the State of Minnesota.

Why Users Test Paints

BY C. O. JUDD
Chief Chemist

Agitating material in drum first, emptying the drum, rinsing emptied drum with thinner to get all color, checking viscosity, preparing test panels, comparing color match with previous shipment, measuring film thickness, determining number of coats to use and giving attention to the correct spraying technique

WHERE LARGE quantities of paint are used, and where possibilities exist that the paint supplier might send a shipment of paint that is combined from more than one mix in the paint factory, a system should be set up with the paint supplier wherein batch numbers would be on every package of paint received. When samples are taken for tests, one sample from each batch can be drawn and tested and, of course, if the sample is drawn correctly, you may expect the tests to conform to the standard of the package bearing that particular number.

In taking a sample of paint, the material should be agitated well so a representative sample will be obtained from the well-mixed batch. In case of a drum shipment, all drums should have the agitator included in the barrel so an air-driven motor may be attached to the agitator and the contents agitated for at least two hours before a sample is drawn, or before the material is dumped into the supply tank.

Your paint is probably received at a "heavier" viscosity than it will be used. If so, it is good practice to take a large part of your reducing thinner, pour it into the emptied drum and wash the drum interior well with this reducing thinner; then use this tinted thinner to "cut" the paint that came from this drum to viscosity. In this way you get practically all of the paint out of the drum, and you have the added assurance that you will get all of the coloring that may have "settled out" in the drum, and which may be necessary to give the finished product that particular color appearance you are looking for.

Color Match Is Important

Color match is naturally an important item. Every batch of paint received should be tested to make sure you have the exact color to match previous work that has been completed from other batches of

paint. There are too many conditions that can enter into the picture to affect the color of different batches of paint received, for this statement to be considered as any criticism to the large and thoroughly satisfactory paint manufacturers we have today, for no paint company in my experience has manufactured paint through an unlimited time without making shipments of paint that were not off-color to some previous shipment sent for the same purpose. In other words, I would not depend upon the supplier's guarantee of color match, but would positively test every different batch of paint before it was sent to the paint line. I am sure that if this is done, it will eliminate a considerable amount of trouble that will come sooner or later.

Panels may be made from the drawn sample to represent your production work and depend largely on the painted work that is being done to govern the method of color matching. Arguments arise too easily to depend on human eyes to determine the color match of sample panels and production work. The paint world of today is looking for a piece of moderately-priced apparatus that will definitely tell when a sample panel is within the color range of your specifications. Nevertheless, the test panel is taken that represents your paint shipment and is allowed to bleach, oxidize, etc., to conform to the future uses of your production work; it is then compared to the production work or to your color standard.

Color Matching Apparatus

I have made a color match cabinet to conform to my specifications that gives a better chance to make a satisfactory color comparison. A small cabinet is made from plywood, approximately 12x12x18-in. long, and painted on the inside with a dead gray. Two flourescent bulbs, 18-in. long are on the floor of this cabinet and are mounted on a rocker. By working a small crank from the outside, the front bulb can be lowered while the back bulb is raised, or vice-versa. Two switch buttons are on the outside of the cabinet to allow you to turn on or off either of the bulbs. While looking through a peephole in the front of the cabinet and viewing your panels by the side of your color standard, and by working the apparatus already described, you can highlight these panels in a very accurate way. This allows you to make a more intelligent decision than in any other way I know of.

A moderately-priced piece of apparatus that is more accurate than the one just described, and one that will allow you to make a better decision in color match, is definitely in demand and I would be interested in securing information about it.

The same sample that was drawn from the quantity of material to make your color match panels, of course, will also be suitable for making test panels for future tests, such as humidity, soak, salt spray, grease fumed discolorations, alcohol, adhesion, flexibility, abrasion, alkali, acid, hot and cold check, etc.

Start With Clean Test Panels

Too much emphasis cannot be placed on the preparation of sample panels. The metal should be clean, smooth and free from rust. One should always eliminate rusty metal in making test panels. Re-

gardless of how oxidation is removed, microscopically there may be some left. From the time a metal test panel is finished, it should not be touched with the bare hands, nor should any foreign matter be allowed to come in contact with it. One should also be positive that all trace of cleaning compounds or solutions are completely removed. Solvent cleaning, whether vapor-degreased or cold, is hardly sufficient.

You will have a much better sample panel if it is phosphate coated, and it should be if this is at all possible. If phosphate is not included in your factory set up, you will find phosphated panels on the market in various sizes, at a very reasonable figure. They have been properly prepared to the correct stage and individually wrapped.

Any drain marks that are on sample panels should be carefully removed with a solution of 50/50 methynol and water. Be sure they are dry before any paint is applied. Such panels must not be touched until the top coat is completely dry. The comparative tests are the best tests to run but, of course, experience naturally will allow a person to know what to expect from any paint for some particular use.

Film Thickness; No. of Coats

Film thickness is something that should carry great importance. Different paints will carry different film thicknesses. There are good film-thickness gauges now on the market and one of these is practically indispensable where a considerable amount of paint testing is done. All individual tests that are being made comparatively, should have approximately the same film thickness. Some persons might say that it is being too technical to allow .2 or .3 mils between different panels to make a difference, but he speaks only from lack of experience, and any amount of testing with full consideration given to film thickness will readily and without doubt change his mind.

In speaking of film thickness, the question naturally arises as to whether a 3-coat job (prime, intermediate, finish) could be cut to a 2-coat job (prime, finish), or whether or not a 2-coat finish could not be reduced to a 1-coat job. It is true that the only way this could be answered would be to take into full consideration its future use. Ordinarily speaking, if the number of coats could be reduced, I am afraid it would be found that film thickness would have to be maintained in the lesser number of coats to get the same results from the major tests, such as humidity, soak, salt spray, etc. However, at the same time, it is possible that one might discover a particular property in the result of fewer coats that would please him better.

Generally speaking, the number of coats cannot be reduced in an apprehensible amount with less applications of paint, when it is found that the coat of paint will have to be held in the same film thickness that is ordinarily gotten with the one or two more coats of paint the job originally required.

Spraying Technique

Referring to my article in INDUSTRIAL FINISHING for August, 1940, page 32, under "Spraying Technique," the statement was made that if a certain technique was found to give the desired

thickness, then no more or less paint should be applied from one day to the next. If the spray men are properly trained and are worked with constantly, and if the spraying technique is applied in its best form in regard to the number of passes and the way the stroke is made with reference to the angle the gun is held, and the distance it is held from the work, there is no reason why paint thickness should vary appreciably.

Allow me to also add that a spray man should never be permitted to tamper in any way with his spray gun, or regulate air and liquid pressure. Such actions as these should be done after a certain decision has been arrived at, after tests have been run; and under no circumstances should they be changed from one time to another, merely because authority wants to be aired. If conditions in production arise which make a change necessary, then new standards will have to be set.

Industrial Handling Bulletin

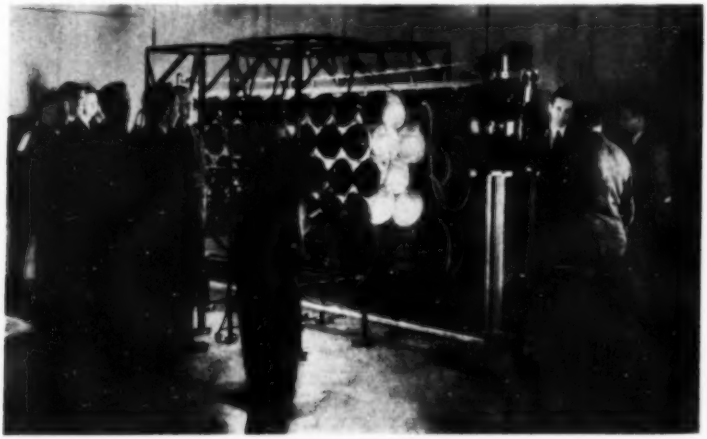
Seven typical steps common to most industries, and each a spot where waste may occur in materials handling, are described in a 12-page illustrated bulletin issued by Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland, Ohio.

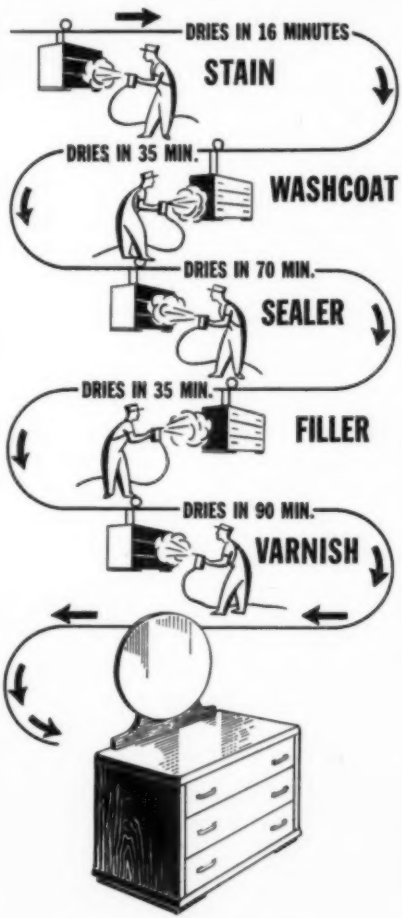
From incoming car to the receiving department; receiving to storage; storage to processing; through the processing department; into storage; from storage to packing, and then in to the outgoing car or motor truck, are the seven steps. Conserving the most money in materials handling is accomplished by transporting loads with power industrial trucks through each of the seven steps—not merely at one or two points.

Infra-red Show Interesting

The growing importance of infra-red baking for industrial finishing operations was evidenced by the interest shown in a 3-day infra-red show sponsored recently in New York City by the American Institute of Electrical Engineers.

Ault & Wiborg infra-red finishes were baked onto various metal products in demonstration runs at the Engineers' Building, under the bank of General Electric infra-red lamps shown in the accompanying illustration. Fostoria equipment was used. On the table are various products bake-finished with this method. Included are a cash register, heaters, a steel storage-file, and oil-burner housings.





SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

"We finish 26 tons of furniture per day

WITH 35 MEN AND FIVE *S-W PRODUCTS!"*

●

That's a large and well-known furniture manufacturer speaking. But that's only half the story. With their conveyor finishing technique and special Sherwin-Williams finishes from stain to top-coat, they cut rejects 75%, cut labor cost 33-1/3%, and get better-looking products than they've ever had before!

Conveyorized finishing can work wonders in many industries, but its success always depends upon the actual finishing materials. At the above-mentioned plant, for example, the stain must dry in 16 minutes—not 17—and wash-coat must be ready to sand in exactly 35 minutes. Deviate one minute on any one of the five coats—and your conveyor system is thrown into hopeless confusion!

Which is why so many manufacturers who adopt "assembly line" finishing, call in the manufacturer with years of conveyor finishing experience — Sherwin-Williams. With hundreds of chemists and technicians behind him, and with expert knowledge of conveyor finishing needs at his command, your Sherwin-Williams representative can surely help you. Sherwin-Williams Co., Cleveland, Ohio, and all principal cities.

Applying Wrinkle Finish to Flexible Sheets

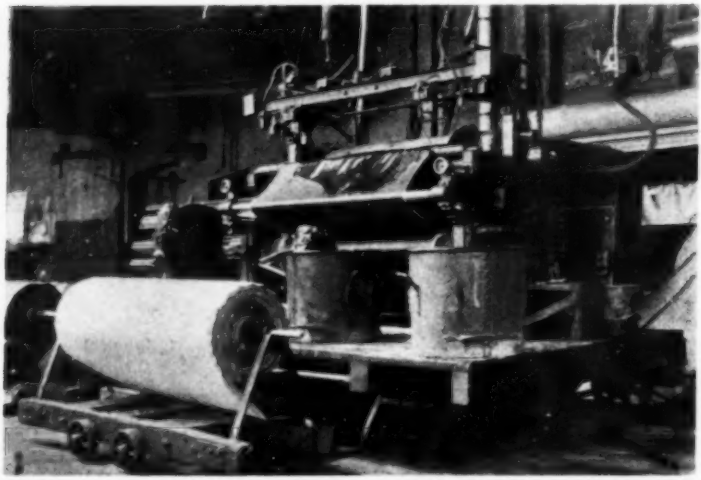
WRINKLE finish may be applied to paper, oil cloth, textiles, leather goods and other flexible materials in a variety of colors and patterns. While in special cases the procedure may vary, the manufacture of Craftene and Kraft Craftene* (wrinkle finished cloth and paper, respectively) serves to illustrate the process.

The first step in the manufacture of Kraft Craftene takes place in what is known as the cook shed. Here drying oils, synthetic resin and driers are blended in direct fired stationary kettles, and these devices are equipped with cooling coils through which heated oil may be circulated as desired. Thus, it is possible to maintain the very rigid temperature control necessary. The cooked oil is then centrifuged and pumped to storage vats.

The coating mix consists of the cooked oil, inert pigments and, in the case of tints, is colored with ground chemical pigments. The compound is mixed on change-can mixers and subsequently ground on roller mills.

Regarless of whether this formulation is applied on a coated fabric or on paper, the surface must be pretreated to insure proper anchorage between the base and the coating. The wrinkle mix is applied by the means of an English-type coating head shown in the accompanying illustration. This consists of an endless driven rubber blanket and a steel knife so mounted that its height, pitch and level can be adjusted at will. The base flexible material to be coated passes between the knife and the blanket. The wrinkle finish mix is poured before this knife, and spreads onto the base material as it is drawn under the knife by the

*Craftene and Kraft Craftene are manufactured by The Taunton Coating Mills, Inc., Taunton, Mass.



Wrinkle finish is applied to sheet stock by means of this English-type coating machine.

WHEN specifications for finishes are being considered it is good to know that there is a yard stick available for use in comparing and measuring various brands and types of finishing materials under consideration. Egyptian Finishes have been used as a yard stick for over a half century. It is quite usual to read in a set of specifications . . . "Egyptian or its equal."

Lacquers, synthetics and novelties as well as special finishes for individual requirements are available to the manufacturer of all types of industrial products. These finishing materials are supplied for spray, dip or brush application and are formulated for air-dry or high or low-bake.

The next time you are in the market for finishes we would appreciate an opportunity of discussing your requirements with you through one of our technical representatives.

A request for such an interview will bring our representative promptly and naturally places you under no obligation.

THE EGYPTIAN LACQUER MANUFACTURING CO.
ROCKEFELLER CENTER NEW YORK

EGYPTIAN FINISHES
Superior FINISHES

Announcing
A BLESSED EVEN
FOR FURNITUR
FINISHED WITH
DU PONT
DUCO
PYROXYLIN
LACQUER
The Finish of Enduring Beauty
DU PONT
REG. U.S. PAT. OFF.

A streamlined new tag for DUCO...redesigned to help your customers sell your furniture faster!

IT'S a *handsome* baby. One that women can't help admiring. And it's a hard-working kid, too. Its job is to tell your customers' prospects about the extra value DUCO gives *any* piece of furniture. Not in initial beauty alone. But in its outstanding ability to keep furniture beautiful in spite of hard wear and tear.

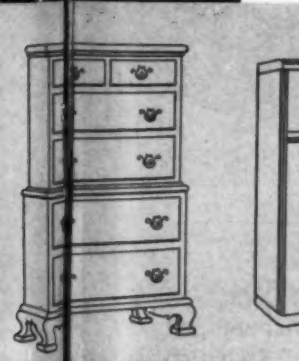
This tag will impress your customers' prospects. They know already the Du Pont reputation for highest quality. And DUCO means the most famous name in furniture finishes.

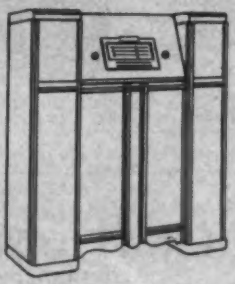
Put this tag to work for you. Let it help your customers sell your DUCO finished furniture *faster*. E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington, Delaware.

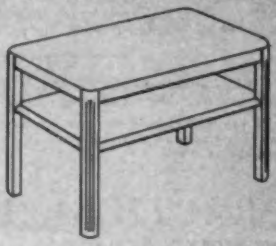
To sell more...quicker

Send for this FREE folder!

"TAGGING SALES" describes Du Pont's new program for quicker, better DUCO identification to help your customers sell your furniture faster. Contains samples of the powerful new DUCO Tags . . . also a booklet "What's Behind the DUCO Tag?" which you can mail to retail customers to give them interesting facts about DUCO for their sales talks. Send for this valuable material today. E. I. du Pont de Nemours & Co. (Inc.), Room 7156, Du Pont Building, Wilmington, Delaware.







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E. I. DU PONT DE NEMOURS & CO. (INC.) . . .
FINISHES DIVISION, WILMINGTON, DELAWARE

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THE LATEST CHEMICAL FORMULARY

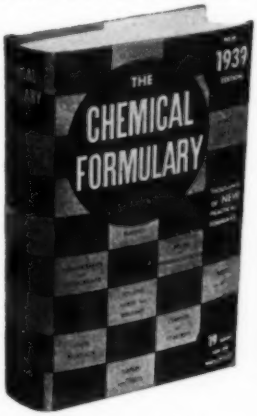
VOLUME IV

Thousands of Practical Formulae!

Over 600 pages containing thousands of practical formulae — many of which have never before been made public. One formula may be worth hundreds of dollars to you.

A condensed collection of new, valuable, timely, modern, practical formulae for making thousands of products in all fields of industry. (See partial list of contents below.)

The experience of hundreds of chemists and engineers is now available to you. Use it and profit. *Have at your finger tips the boiled-down essence of the latest commercial methods of hundreds of chemists, engineers, technicians and professors. Have it when and where you need it.*



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If you already have Vols. I, II and III, you won't need urging to get Vol. IV. It contains entirely new and different material. It will be just as valuable to you as the previous volumes.

If you do not have the previous volumes, get all four if you can afford it. Or start with Vol. I, and after you have that, we know you will want the others. Remember, each volume is different and complete in itself!

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More than 600 pages (6x9 inches)

rubber blanket. Automatically actuated wings, at each selvage, serve to keep the wrinkle coating mix on the base and to keep the blanket clean. The character and pattern of the wrinkle is determined by the consistency of the mix, angle and bevel of the knife, pressure of the knife against the blanket and the speed of the machine.

As the wrinkle-finish goods pass from the blanket, they are automatically picked up by horizontally supported "rack sticks." These sticks are delivered onto overhead traveling chains which carry the festooned material on into the drying ovens, and here the goods hang while drying takes place.

After cooling, the wrinkle-finished material is pulled out of the ovens by a batching dummy. It is then trucked into the inspection department and cut into such widths and lengths as specified, and it is ready for packing and shipping.

Wrinkle Finishes on Wood

CURRENTLY the woodenware manufacturer is witnessing an awakening to the decorative and promotional advantages gained by the application of wrinkle finish to his products.

The application of wrinkle finish to wood is readily accomplished and results in several economies. With wrinkle finish it is not necessary to use kiln-dried lumber, as in the case of most other finishes. In fact, the use of kiln-dried lumber increases drying difficulties.

During baking, the finish will wrinkle on the harder portions of the grain but will sink in on the softer spots, thus producing an attractive variegated texture.

As wood presents a different surface to finish than metal it is first necessary to supply a non-absorbent surfacer to the wood. While some kinds of wood will take wrinkle finish directly without an undercoat, these occasions are so rare that the thought may be dismissed entirely.

To supply a non-absorbent surface, two materials are available —a paste filler and a synthetic primer-surfacer. The paste filler is applied by the usual methods of rubbing in and allowing the surface to dry before applying the wrinkle finish. However, repeated laboratory tests have shown the primer-surfacer to be the better method. It gives a hard, non-absorbent fast-working surface.

The wood is first lightly sanded (an operation which may be eliminated in many cases) followed by a coat of alkyd-type synthetic primer-surfacer. This coat is allowed to dry for three or four hours, or until the coat is hard enough to stand a light sandpaper scuffing. Wrinkle finish may now be applied and baked. Either a wrinkle of the varnish or alkyd (synthetic) type may be used. There is practically no difference between the two materials in adhesion.

Baking temperatures vary with the kind of wood used. Some woods can be baked at 200°F. for an hour or two. Lower temperatures and longer baking times are also satisfactory—and probably preferable in most cases. — NEW WRINKLE, INC.

Wrinkle and other popular finishes will be reviewed in the next issue of INDUSTRIAL FINISHING.

The Vanity Finish

(A Bulldog Billingsley Story)

Mr. Herbert Prentis, III, President
Sunny South Furniture Co.
Sun City, N. C.
Dear Prentis:

I expected to have Mort Goodman's order for 200 of our 900 series bedroom suites and to be back in Sun City, a week ago. Now Goodman doesn't doubt that our design is beautiful and authentic, our selection of wood tops or our finish excellent; but he does doubt that he can move 200 of them at the price he would have to get. I've been hanging around on his floor and will stay there till I get the order. (They don't call me Bulldog Billingsley for nothing.) Please wire me $200.00 for expenses.

Yours truly,
Joe Billingsley
Sales Manager,
Sunny South Furniture Co.

MR. JOE BILLINGSLEY,
BLANK HOTEL
CHICAGO, ILL.

DON'T COME BACK WITHOUT GOODMAN'S ORDER, BUT DON'T TAKE TOO LONG AND EASY WITH EXPENSES. THE WAY YOU SPEND MONEY YOU SHOULD HAVE A BIG RECIPROCITY CREDIT SOMEWHERE. ARE YOU EMPHASIZING OUR WIDE PUBLIC ACCEPTANCE FOR QUALITY AND GENERATIONS OF ASSOCIATION OF THE NAME OF PRENTIS WITH QUALITY FURNITURE?

HERBERT PRENTIS III, PRES.
SUNNY SOUTH FURNITURE CO.
SUN CITY, N. C.

Mr. Herbert Prentis III, Pres.
Sunny South Furniture Co.
Sun City, N. C.
Dear Prentis:

Your day letter received. Your confidence in me is well founded, but for a while today I had my doubts as to whether I'd ever sell Mort Goodman those 200 suites. I had him almost sold when we got a bad break. You know how easily upset he is. Well today one of his men sold one of our 800 line bedrooms, of which he has about six in stock and is anxious to clean out. The sale was made this morning and cancelled this afternoon.

What do you think the customer selected instead? One of Anonymous Co.'s suites, a comparatively ordinary job, fair cabinet work, fair finish, in fact fair all the way around (note this last phrase). And why did she pass up our beautiful design, our excellent cabinet work, our generations of good reputation—for a suite by a maker of no reputation except perhaps in the box shook business? I found out and I'll tell you.

She had originally ordered our No. 800 on account of the vanity, and it is a beauty. However, she found that the bedroom in her present quarters was not large enough for her to use the vanity. She then found that Anonymous Co.'s vanity had a nicely veneered back and a finish equal to the front and top. She could use it as a desk in her living room until she moved to larger quarters. She felt quite sure that Anonymous' suite was very fine "because of the care in finishing even the backs of the pieces."

I was in no position to argue when our vanity showed a back of bare wood with a border of stain overspray and a few handprints of stain and filler. Perhaps I could have suggested that the stain overspray was an antiquing effect and that the hand marks were efforts at "studied crudity," but I didn't have the heart when I thought of our smug superiority, allowing an ex-boxmaker to show off shoddy goods to our disadvantage.

But mine is not the character to take a beating lying down. I obtained permission to talk to the customer and resold her on our suite by promising to have our vanity paneled on the back and finished. For a quick job this cost you $25.00 at a local cabinet shop.

Now here is the good news. I got M. G.'s order for 200 of our No. 900 suites, providing we panel the backs of the vanities and stain and seal the backs of the other pieces. This is something we should have done long ago. Look inside or at the back of a good piano and you'll see an excellent finish. A good suite has a good lining —etc., etc.

Am not trusting M. G.'s order to the mails. Will bring it in myself. See you soon.

Yours truly,
Joe Billingsley,
Sales Manager
Sunny South Furniture Co.

(Submitted by Harry Daniels.)

"Excelglas"—New Baking Enamel

A new baking enamel bearing the registered trade name "Excelglas," has recently been developed by the Lynnwood Laboratories, Inc., 430 Riverside ave., Newark, N. J. It is claimed that this baking enamel withstands the corrosive action of perfumes and alcohols. It may obtained in clear, black, white, aluminum and colors, and can be sprayed, dipped or roller coated. "Excelglas" can be applied directly to any metal including brass without the use of any prime coat or any other pretreatment of the metal, according to the manufacturer.

BERRY BROTHERS APPROVED FINISHES

IF you are figuring on Government contracts or are now doing Government work, Berry Brothers will be more than glad to assist you in laying out the finishing program. If Government work is new to you, we are interested in helping you get production moving in the shortest possible time . . . a vital need today.

Government Specification Finishes and requirements are not new to us . . . formulas have been prepared and Specifications are in our files to cover practically all of the finishing material requirements for the Defense Program.

As a means of doing our bit, plant capacity, laboratory facilities and past experience are freely offered to those who are taking part in the Re-Armament Program. May we help you?

BERRY BROTHERS
Industrial Varnishes • Enamels • Lacquers
DETROIT, MICHIGAN • WALKERVILLE, ONTARIO

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Improved Aluminum Finishes

The Stanley Chemical Co., East Berlin, Conn., announces two improved aluminum finishes for metal. These materials known as 66H-1307 Aluminum Baking Synthetic, and 66H-1515 Aluminum Air-Drying Synthetic, produce coatings which closely resemble a dull chrome-plated finish. They are extremely durable, have excellent adhesion and weather-resisting qualities, and are so smooth they give the appearance of a continuous sheet of aluminum.

On long standing they retain, to a very high degree, their original color and leafing properties and, as they are non-settling, only normal stirring is required before use.

While both materials are intended for spray application, 66H-1307 Baking Synthetic has exceptional flow and dipping qualities which leave the surface free from sags, runs or drips. This coating should be baked for 45 minutes at 325°F.

Portable Belt Sander

A lightweight 2¼-in. belt sander called "Zephyrplane Junior" has been introduced by Skilsaw, Inc., 5033-43 Elston Ave., Chicago, Ill. The machine has a die-cast aluminum frame for lightness and strength, ball-bearing construction and a powerful sturdy universal motor.

Weighs only 9½-lbs.

New...

MATERIALS SUPPLIES EQUIPMENT

Other features of safety and convenience are a Bakelite handle for cool comfort, a safe trigger-type momentary switch and a patented "touch-control" lever which permits quick changing of belts. The belt travels at a speed of 600-ft. per minute, is kept uniformly taut by a coil spring, and can be easily centered by a simple adjustment. A variety of belts are obtainable, adapting the tool perfectly for use on wood and metal, for removing varnish, for smoothing surfaces, and for polishing.

The machine has been designed by experienced Skilsaw engineers to provide perfect balance so that uniform pressure is applied over the entire sanding area. This helps to produce a perfectly smooth, ripple-free surface, faster and more easily than by hand sanding.

Picture-Frame Lacquer

A lacquer that is lasting and beautiful, permanent in shade and sheen, and that requires no undercoating or sealing of the wood—one especially suitable for wooden picture frames and moldings—is announced by Fred'k. A. Stresen-Reuter, Inc., 2113 Medill Ave., Chicago, Ill. The formulation of this lacquer is such that it will prime the surface and build up the surface defects of the wood as well as produce a beautiful finish coat, all in one operation.

The new material is called Essar No. 4202 White Picture Frame Lacquer. It requires 100% thinning to spray and, with normal handling on the part of the spray operator, will give a beautiful finish to the frame or molding;

YARLITE —the best Short Hi-Heat BAKE SYNTHETIC

Courtesy H. D. Dougherty Co., Philadelphia, Makers of Hospital Equipment

Makes a beautiful porcelain like finish in white or colors. Excellent for hospital furniture, dental equipment and many other products.

Yarlite is hard, tough and durable. Resistant to alkali, marring and chipping. One coat sprayed is sufficient on most articles.

Yarlite is made so as to meet your baking requirements with a range of 15 minutes at 300° F. to 1 hour at 250° F.

Write today for Sample of Baking Yarlite.

YARNALL · THE SHIELD OF PROTECTION

YARNALL PAINT COMPANY

Industrial Division

Philadelphia · · Penna.

covers completely in one coat and gives the appearance of depth to the finish. The finished surface shows a semi-gloss luster. This lacquer is also available in a high-gloss luster. The material can be obtained in a wide range of tints.

The company believes that this recent development in their laboratory is the ideal lacquer for wooden picture frames and moldings, adding to the richness and quality of these products.

Protects Hands

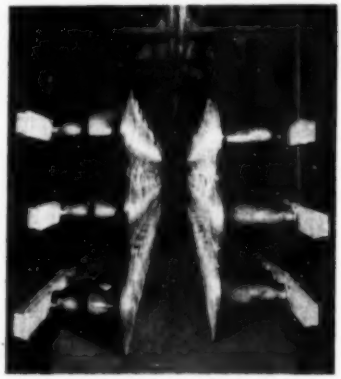
A new protective hand cream called "Mitts," for preventing the skin from absorbing paint, ink, grease and other materials which ordinarily are difficult to wash off, is announced by Mitts Mfg. Co., 367 E. 45th St., Brooklyn, N. Y. It is rubbed on the hands before starting to work in or with materials difficult to remove. "Mitts" is water-soluble and washes off easily with soap and water, taking all the dirt with it; it prevents occupational skin irritations.

Thermalamps for Rapid Drying

According to Mr. Paul H. Goddell, manager of the Radiant-Heat Division of the C. M. Hall Lamp Co., Detroit, Mich., the Thermalamp is a new type of sealed-beam infra-red source developed to meet practical industrial heating conditions. It consists of a special Mazda-made source of 1000 watts, mounted in a 24-karat gold reflector, with lens for heat distribution control and glare elimination.

These lamps are used in the field of drying, chemical and baking processes—for example, in the baking of enamel coatings on automobiles, refrigerators, washing machines, etc.

Ovens are custom-designed to meet specific requirements and results are guaranteed. Pre-wired channels, with Thermalamps properly spaced, are easily mounted on ordinary pipe framework to form an oven of any dimension. Ovens may be designed for mounting overhead, in the conveyor line, or in vertical sections for space saving.



A new Thermalamp installation, with heating units on both sides of a conveyor line.

Thermalamps have a sealed-beam device, therefore it is only necessary to occasionally wipe the lens instead of repeatedly cleaning the open reflectors and lamps.

Paint-Spray-Booth Fan

A new paint-spray-booth fan, with guaranteed performance ratings, has been placed on the market by the DeBothezat Ventilating Equipment Division, American Machine and Metals, Inc., East Moline, Ill. This fan assures required protection against the hazards of spray painting under all operating conditions. Being built to Underwriters' specifications, the fan is corrosion-resisting and non-sparking. The motor is substantially mounted and perfectly balanced outside the fan housing on an adjustable base, and power is transmitted by V-belts through a vapor-proof drive chamber. Fan wheels are of die-formed aluminum, and blades are easily removable for cleaning. An 8-page bulletin with complete ratings for the standard sizes (18x42-in.) is available by writing to the manufacturer.

for

the INDUSTRIAL and TECHNICAL trades

Write Us!

OXFORD VARNISH CORP.

DETROIT, MICHIGAN

"Notol"—Toluol Replacer

With national preparedness in the forefront of the news, The Neville Co., Pittsburgh, Penna., announces the availability of "Notol," a new replacer for industrial pure toluol.

Since toluol is an important item for munitions manufacture, the company regards "Notol" as a timely product and feels that it will prove increasingly useful as toluol grows more scarce.

"Notol" is characterized by high nitrocellulose dilution ratio (comparing favorably with toluol) and sells for less than toluol.

New Spray Gun

The O. Hommel Co., ceramic supplier, Pittsburgh, Penna., announces the introduction of a new model "Kingbee" spray gun. This new model is especially suitable for spraying wide surfaces. Besides a wider spray, allowing for greater efficiency, the new model has a finer atomization, speedier distribution of material, is very easily cleaned, will not clog, is sturdily constructed and will resist a great deal of wear with a minimum of repair.

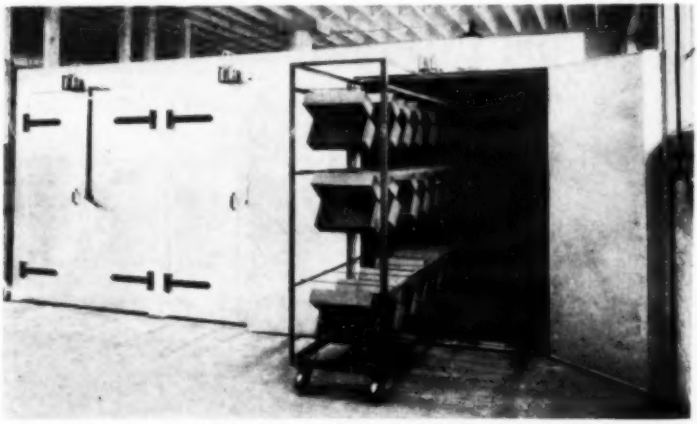
American-Marietta Company Expanding at Kankakee

The American-Marietta Co. has started construction, at its Kankakee, Ill. plant, of two new buildings to handle the rapidly increasing demand for the company's products. The buildings are part of a $200,000 modernization and expansion program, at Kankakee, that was begun about a year ago and is designed to carry over a period of 18 months. The figure includes buildings, equipment and improvements.

One building is to house a new varnish and synthetic-resin laboratory. The latest and most modern research and testing apparatus will be included in its equipment.

Due to the foreign situation, which has curtailed to a large extent the importing of such essential oils as China wood and perilla, the company has found it necessary to carry on considerably more research on domestic oils, and in the past 12 months has made startling discoveries with these oils.

The second unit is a 3-story extension of heavy mill construction, to the plant's main building. It will be used for the manufacture of roof coatings.



Cleanliness and safety are features in the metal-finishing department where these ovens are in operation. Photograph supplied through courtesy of the R. C. Mahon Co.

. . . there's an M&W WOOD LACQUER

to give you the best results for your money. M&W wood lacquers meet the high standards of all other M&W finishes. The line is equally complete—a finish for each product, process, or service requirement.

Sanding sealers . . . Combination one-coat stains and sealers . . . Flat and semi-gloss wood lacquers, which give dull finishes without rubbing . . . Clear gloss wood lacquers, for various grades of work, meeting the requirements of furniture, radio cabinets, wooden golf-club heads, tennis rackets, and other products.

Special M&W wood lacquers have good build, and cold-check and weather resistance. They rub and polish well.

Send for full information.

Maas and Waldstein Co. Newark, N. J.

Branch Offices and Warehouses . . . 1658 Carroll Ave., Chicago . . . 1238 W. Pico Blvd., Los Angeles

LACQUERS **PIONEERS IN PROTECTION** ENAMELS

Stenciling Methods

Kindly suggest an economical and serviceable method for stenciling kitchen sets. We have tried masking tape, but on 50 or 100 this is much too slow. We had zinc patterns but these tend to slip. Do you know any other method that could be used to much better advantage?—B. & G. Co.

We suggest that you read "Suggested Methods for Decorating Furniture", by T. J. Pirring, published in March, 1940, issue of this magazine. Also, "The Open-Stencil Method of Decorating Furniture," by Norman H. Voigt, appearing in May, 1940, issue of INDUSTRIAL FINISHING.

Then there is the silk-screen method of decoration which has been explained in articles farther back in INDUSTRIAL FINISHING, and which is described and illustrated in various books, for example, "Silk Screen Methods of Reproduction," by Bert Zahn; price, $3.00, at INDUSTRIAL FINISHING'S office. —ED.

Excessive Humidity

We are considering installing electric air heating devices in our paint shop. We have a peculiar condition in this territory (Savannah, Georgia) in that we have a very high humidity, and the purpose of this electric heater would be to dry the air rather than to warm it. There are very few days in the year when it would be necessary to maintain more than a 10° differential between the outside temperature and the temperature inside the paint shop.

We are doubling our paint shop capacity and it will be necessary that we install our heating apparatus immediately. We would appreciate any information or suggestions you may have to offer concerning this, together with your recommendations.—S. P. Co.

We suggest that you also investigate the merits and possibilities of certain dehumidifying equipment. Some information about one make of apparatus for this purpose, as published in a former issue of INDUSTRIAL FINISHING, follows:

"The Lamson dehumidifier is designed to meet the many demands of industry where the control of humidity is a vital part of processing . . . . affords manufacturers an opportunity to introduce controlled dry air into their manufacturing processes, regardless of weather or atmospheric conditions. A solution of lithium chloride is the moisture-absorbing agent of the dehumidifier. Its many qualities make it ideal for commercial drying.

"In the process of absorbing water vapor, the lithium chloride temperature rises due to the liberation of the latent heat of condensation of the vapor plus the slight heat of dilution of the solution. This heat is easily removed by cooling the solution with ordinary water. No special water is necessary and refrigeration is not required. The temperature of the dehumidified air also may rise a few degrees. In some industrial applications, this constitutes a distinct saving of steam required to heat the air to usable temperature.

"Because it is a very simple matter to regenerate the lithium chloride solution, it is used in a continuous dehumidifying cycle. In order to keep the solution at the proper strength,

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

HOW DO YOU WRAP CHRISTMAS GIFTS?

It would be much easier and less costly to wrap Christmas gifts in ordinary kraft paper and white string. But just visualize a Christmas tree laden with such packages. It wouldn't be Christmas!

Instead of the easy way, we give finish to our gift packages by using colorful papers and brilliant ribbons. It adds attractiveness, splendor, glamour . . . it stimulates appreciation and enhances the value of every gift.

With commercial products a quick covering of ordinary paint, stain or lacquer is the easy way, but why not give those products the advantages of the gift package . . . a finish that sparkles, attracts, enhances value, sells?

To help you obtain such a finish for your products we offer the services of our Creative Studio. Write us today if you have a finishing problem.

ROCKFORD VARNISH COMPANY

Manufacturers of Finishing Materials

ROCKFORD • ILLINOIS

NO TAMPERING WITH QUALITY

Kindly mention INDUSTRIAL FINISHING when writing advertisers

all that is necessary is to heat a portion of the solution in a current of air. Under these circumstances, it gives off the moisture which it absorbed from the air while conditioning the air for process use. The regenerator is automatically controlled by an electrical device which is set to maintain the desired specific gravity of the solution. In this way regenerating energy is used in direct proportion to operating requirements."

Several concerns are in position to supply apparatus for removing the excess moisture in air within rooms—but of course, the rooms should be closed to exclude the inrush of moisture-laden air from the outside.—ED.

Fiber Hamper Seats; Pigment Glue Size?

In manufacturing fiber hamper seats we use a regular fiber undercoat as a base for our enamels. The problem we have at hand is this:

Furniture Manufacturers:

GKS FORCED DRYING SYSTEMS
for wood furniture finishes

OFFER FIVE ADVANTAGES!

Reduced handling and processing cost.

Reduced finishing material cost.

"Same-day" finishing and shipping.

Tougher, more durable finish.

No space needed for overnight drying.

GEORGE KOCH SONS, EVANSVILLE INDIANA

Write for more information

As far as the fiber material is concerned, it does not need much of an undercoat. It is the pine wood top frame that requires the primer.

We must dip the raw fiber baskets in a glue size after they are taken off the form, in order to shrink the fiber tightly on the frame. This glue size mixture is made up of 8-lbs. of animal glue to 30 gallons of water.

Our goal is to get some sort of white water paint to mix in with this glue size, so that the shrinking and undercoating operations will be one in place of two.

We could either spray this combination of glue size and paint, or dip it in the large tank we are now using.

It is probable that the dipping process would be preferable. If you can aid us by suggesting what type of water paint pigment to mix with glue-size liquid, we will appreciate hearing from you.

Of course, the cost must be held down to a minimum because we are now using a spraying primer that only costs us 78 cents per gallon. Whatever pigment we put into this glue size liquid must be low in cost. —H. W. Co.

I am familiar with the intense competition experienced by manufacturers of fiber hamper seats. I know of one concern that did a tremendous business in low overhead quarters, but still failed. So, with such intense competition, it is not surprising that the manufacturers of these fiber hamper seats should want to cut their costs.

The use of glue size in the present finishing schedule is bad enough without going to a pigmented glue size. Not all manufacturers find it necessary to use the glue size for the purpose of shrinking the fibers on the frame. Some find the

try to scratch or mar it!

Here is a lacquer finish that cannot be marred or scratched with the thumbnail, or other destructive agencies—a much tougher piece of goods than the ordinary lacquers. It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods . . . It is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended for first coat.

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

glue objectionable, inasmuch as many of these hamper seats are used in bathrooms where the humidity is very high, so that the glue is not a good undercoat for the paint.

Pigmentation of the glue size is, to my mind, undesirable, as the non-volatile content of the glue solution is only 3 1/3%. This is certainly not enough to form a good undercoat film in conjunction with pigment. To increase the concentration of the glue is also undesirable, as a heavier film of glue will eventually produce cracking and crazing.

The only constructive suggestion I can make is that you turn to the use of a better quality undercoat, which can be applied by spraying to the wooden parts only. Of course, I am not familiar with the 78-cent material you are now using, but off-hand I would say that such a cheap material would not be economical to use when you are using a 2-coat system and trying to get a presentable finish. It seems to me it would be cheaper to buy a higher grade undercoat and confine its application to the wood tops alone. Then, for a final coat, you could use a good one-coat fiber enamel and produce an attractive and serviceable finish.—HARRY DANIELS.

Glue Stains in Veneered Work

As a reader of your INDUSTRIAL FINISHING for years, we would like to know if you can tell us how to overcome glue stains in walnut panels.

We have been using Perkins Glue Co.'s No. 6600 glue, and have

also used Monite and Casco, but all seem to stain, which is hard to bleach out and then have the stained parts finish without showing.

We have been using muriatic acid, which seems to draw out the glue but it leaves a sort of brown spot that shows badly when finished.

We would like to know of some way to handle these glue stains in finishing . . . . S. C. Co. (High Grade Fixtures).

EDITOR'S NOTE—Since your stains are caused by glue, then here is the place to find and correct your trouble. Two nationally-known glue manufacturers offer the following recommendations:

The best way to prevent glue staining on any kind of wood construction is to first take the necessary precautions. The following procedure seldom misses.

We assume that none of the face veneers in these plywood panels are thinner than 1/28-in.; even then, certain kinds of stock, such as mahogany, birds-eye maple, etc., should be sized before receiving the spread of glue. If you hold a piece of one or both of these kinds of veneer up to a window light, you can look right straight through the wood. Sometimes large check marks appear in the mahogany. Birds-eye maple consists largely of little whirls or knots that act the same as end wood inside the construction. The idea is to seal these pores first.

The next step is to secure a satisfactory non-staining glue. In this case the selection of Perkins

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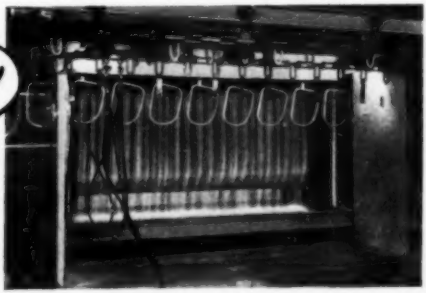

The Hydro-Whirl attains a proper balance between the speeds of air and water and static pressures. The changed direction of air force causes the paint to be trapped before it travels very far into booth. Thus the pigment is brought down into the sludge tank where it can be easily skimmed off. The use of the Hydro-Whirl shows material reductions in maintenance costs.

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No. 6600 was correct; however, the glue must be properly mixed. When it is applied on woods that are known to have staining problems, just as thin a spread of glue as is possible should be applied—just so the veneer is covered—with no dry spots. After spreading the glue, the panels should be placed under pressure within 15 to 20 minutes. Then these veneers should be interlayered with paper to guard their faces.

A pressure of 95 to 125-lbs. is generally sufficient. Under normal weather conditions, the panels can be removed in from 2 to 4 hours. They should be promptly stacked on cross-sticks to dry. With these precautions, good commercial panels, free of objectionable stain, are always produced.

Muriatic acid is too strong a solution for attempting to remove glue stain. Oxalic acid is the material most commonly used. This is prepared by dissolving 1-oz. of oxalic acid crystals to 12-oz. of water. The stained surface is then sponged with this solution. It is important that all residue chemicals be removed with a damp cloth; otherwise this will affect the finish . . . . —PERKINS GLUE CO.

We are sending you a reprint of an article entitled, "Stain-free Gluing of Thin Veneers," which goes through this matter in considerable detail. It shows how to prevent the incidence of stain; and, if in spite of precautions, staining does occur, a practical method of removal is given.

We must supplement all of this by pointing out that during the last three years the development of synthetic urea-formaldehyde glues, of which our product, Casco-Resin, is representative, has elim-

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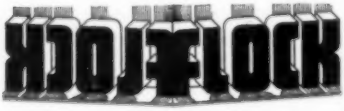

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inated the basic cause of stain, which is alkalinity in casein glue. A urea-formaldehyde resin is either at the neutral, or on the acid side, and thus there is no unfavorable reaction with an acid wood such as oak. Its increasing use is eliminating the basic cause for complaint, such as exists with the S. C. Co.—CASEIN CO. OF AMERICA.

EDITOR'S NOTE — The reprinted article contains much valuable information both on preventing and removing stains, but is too long to be published here. If you do veneering we suggest that you send for a free copy, addressing your inquiry to Casein Co. of America, 350 Madison Ave., New York, N. Y., attention of Mr. W. F. Leicester, Vice President.

Chair Seat Aluminum

In the October issue, on pages 64 and 66, you have a discussion (Q. & A.) on aluminum finish for chair seats. It appears to me that the EDITOR'S remarks cover this situation adequately. The rubbing-off of aluminum is a very common trouble. For chair seats, my recommendation would be the use of a synthetic undercoat that would take a top coat of bronzing lacquer. To prevent the aluminum from rubbing off, I would then apply a double application (two double coats) of clear water-white buffing lacquer.

This is the type of system used by casket manufacturers, and it produces a beautiful finish of unusual depth. Of course, the use of a top coat over the bronze kills some of the natural brilliancy of the bronze, but this is necessary, as the brilliancy is a contributing factor to the rubbing-off trouble;

demonstration upon request . V-1417

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the brilliancy is due to the penetration of the flakes through the surface of the film.—H. DANIELS.

Will Remedy Metal Casket Trouble

I have found much valuable information in your magazine, and, in turn, I might be able to help the writer of the letter signed "L. R." in the Nov. issue (page 60) wherein he describes his trouble with metal caskets "peeling." I have been doing this kind of work several years, and will briefly describe our cleaning system.

For a cleaning agent we use solvent naphtha with about one quart of ethyl acetate mixed in each gallon. With No. 3 steelwool, dipped in this mixture, the casket is scrubbed until the metal is bright and cleaned. Rust and corrosion are sanded off with No. 100 grit sandpaper. Round corners must be given special attention because the spinnings are usually coated with wax or grease in the shaping process. The surface is then wiped off with a clean dampened cloth and brought into the finishing room.

The next operation is blowing out the solvent from the joints and crevices with a duster gun, followed by a wipe-off with alcohol to remove any acid smears that may remain on the metal. The alcohol dries quickly and the primer may now be aplied.

Regarding primers, and I have tried many. It seems to me that in most cases adhesion is sacrificed in order to get quick, easy sanding. The company that supplies us submitted four samples before I was satisfied with the results, and now, after I have used it on thousands

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Out January 18, 1941

Industrial FINISHING

of cases, not one has been returned because of peeling.

Most finish salesmen are willing to help a fellow out, when he has difficulties, and we don't hesitate to call them in when the occasion arises.—ALBERT MATLOCK.

. . . One of our salsemen, who specializes in casket finishes, states that he could straighten them out in a hurry if he knew who they are, and if they are located within 100 miles of Chicago. If you care to furnish us with their name and address, we will be glad to do the rest.—AMERICAN PAINT CO.

Machine Sanding Sealer Coat

WHEN YOU are about to use a small portable sander (one of those wherein the pad moves forward and back like hand sanding, but much more rapidly) for sanding a sealer coat, here are facts to keep in mind, based on practical experience:

This application consists of a light sanding to clean up nibs or dust specks. The sealer is a thin coat, therefore, the machine must be applied lightly and moved rapidly over the surface to prevent cutting through. Use No. 5/0 (180) to No. 7/0 (240) grit aluminum oxide (or its closest equal) open-coat abrasive paper.

Howard Smith Becomes Bakelite Varnish Resin Sales Manager

Bakelite Corporation, Unit of Union Carbide and Carbon Corporation, announces the appointment of Howard Smith as manager of Varnish-Resin Sales with offices at New York City, N. Y. Mr. Smith has been with the company since March, 1925, and has always been closely associated with sales and service of varnish resins to the paint and varnish manufacturing industry. He has been in charge of the Cleveland sales office since 1932.

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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EDITORIAL

"More Than Meets the Eye"

How chemical coatings are vital considerations in modern industry and how they are important to everyday living is explained in the new all-color, sound movie, "More Than Meets the Eye," released this month by Interchemical Corp., New York, N. Y.

Chemical coatings—inks, industrial finishes and enamels, textile colors, and other protective and decorative materials — are shown in this film to be important sales influences. It is pointed out that performance today is often taken for granted in a product. But the appearance of the article can "make or break" a sale, whether the product be a refrigerator, a household appliance, a magazine, a printed shirt, or a dress fabric.

In many cases, the chemical coating may be important as adding to the life of the product. For example, when a woman buys a dress her first thought is usually, "How does it look?" Then, if she likes the pattern, she will want to know whether the colors will be fast to sunlight and whether they will remain bright after repeated washings.

"More Than Meets the Eye" describes the processes and research back of the manufacture of these coating materials and shows how the requirements of the ultimate consumer must be taken into account in the manufacturing operations. The enamel finish for a washing machine, for example, must produce a surface so tough that it will resist the chipping and marring and the various deteriorating forces to which the product will be subjected in the user's laundry.

The functions of the various divisions and subsidiaries of Interchemical are outlined in the picture. These units are engaged in producing printing inks, industrial

* * * INDUSTRIAL FINISHING wishes all of its friends a Merry Christmas and a very Happy Prosperous New Year

finishes, textile colors, dry colors and pigments, press equipment, and various related products.

The film has been prepared so that it will be of interest to manufacturers of products requiring chemical coatings and to the general public which uses these products. Since much of the picture is concerned with the production and application of industrial colors like printing inks, pigments, finishes, and textile colors, there are many spectacular color effects.

This movie is available for showings to manufacturers, associations, or groups interested in chemical coatings and their importance both in industry and in our daily living.

Maybe Your Product Needs a Made-to-Order Finish

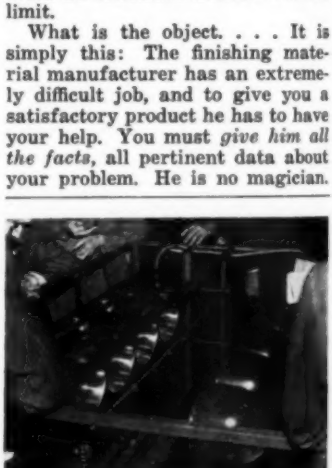
* Unlike architectural finishing materials, such as house and maintenance paints, industrial finishing materials—lacquers, enamels, etc. —are usually not standard stock items made in quantity to sell to a large number of users. The reason for this is apparent. Each particular application for industrial finishing materials has its own peculiar requirements and therefore, to fit the job, a lacquer or enamel must be tailor made.

Take for example, two manufacturers of vending machines. Each, of course, desires a material that will stand up under the abuse to which such equipment is subjected in the field. From this point on, the requirements diverge widely. One machine is made entirely of steel. The other employs die-cast zinc in addition to steel. Hence, the first difference—*adhesion of the material to steel in one case, to steel and die-cast zinc in the other.*

Next, the all-steel cabinet manufacturer has a conveyor oven which can be made to reach 400°F. The other manufacturer has box ovens limited to temperatures of 250°F. Therefore, another difference. Again, one manufacturer may desire the material for both dipping and spraying, while the other is equipped only for spray application.

Such differences in requirements could be continued almost without limit.

What is the object. . . . It is simply this: The finishing material manufacturer has an extremely difficult job, and to give you a satisfactory product he has to have your help. You must *give him all the facts*, all pertinent data about your problem. He is no magician.



Apparatus for demonstrating rapid drying of finished metal parts by infra-red electric lights. Drying equipment consists of nine deep-bowl gold-plated reflectors 10-in. in diameter, with 250-watt lamps. Under the bake, wrinkling started within three minutes and was completed at the end of an 8-minute cycle. Photograph, courtesy New Wrinkle, Inc., Dayton, Ohio.

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* **Guest Editorial . . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.**

You can't simply say, I want a lacquer for such and such a job, and let it go at that. You must tell him what color you want, the gloss desired, the conditions the finish must meet in the field, the kind of equipment you have available and its operating characteristics, and similar information. It must be complete. Otherwise, he won't be able to help you.

So, give the finishing material manufacturer a break. *Give him the whole story about what you want.* If you do this you will find that nine times out of ten he will ring the bell to your advantage.—F. J. M.

Materials for Your Finishes

What affects the manufacturer of finishes also affects the user of finishes—ultimately.—Editor.

* I have read several articles in some of the paint magazines about the necessity of finding something to replace China wood oil as an ingredient in certain finishing materials, but what the paint industries are worried about now, I think, is the fact that our supply of earth colors is threatened. Some of them, you can't buy for any amount of money. We have been unable to buy VanDyke brown for some time.

We are now changing several of our formulas because we know that if the war continues we will not be able to buy raw sienna, yellow ochre and many of the others. To date, no one, to my knowledge, has been able to manufacture a dye to satisfactorily replace any of the earth colors. Every paint maker knows he is now facing a big problem. Unless he can get the furniture manufacturer to bear with him during these trying times, it is going to be a big job to replace these earth colors.

Some one asks: "Why don't we use the earth colors in this country?" We have yellow earth to make yellow ochre, but the best grade of yellow ochre comes from France. Their's is the best. American yellow ochre is inferior to that of the French, as concerns paint, yet American ochre has three times the tinting strength of the French.

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The difference between the two, in all other respects, however, is important. French ochre has a silicate base, whereas American ochre has a clay base. It is because clay readily takes up water that such ochre is not fit for paint. It will draw moisture while incorporated with other materials, and cause scale and blisters. American ochre is not good for tinting; it gives a dull tint; French ochre gives a clear bright tint. American ochre does not spread nor cover so well as the other, therefore American ochre is not used in the best grade of paints. In fact, I can not remember of ever using any of it.

The same can be said about Turkey umber; the best grade is found in Europe. The umber found in America is far inferior.

Our best grades of siennas come from Italy. Even though there is sienna in many parts of the world, few of them are equal, in quality, to that which comes from Italy. The burnt and raw siennas we have been using will be hard to replace, because of their transparency and tone. I could go on and give more reasons why the American earths can't be used, but it would be too long a story.

For VanDyke brown, a suitable shade can be obtained by using black and burnt umber. In formulating stains, fillers, etc., I have been obliged to substitute many other materials for what we had been accustomed to using. Some substitutions are successful; others are not so good. I think we will be able to do without raw umber, raw sienna, yellow ochre and VanDyke brown in stains and fillers, but I wouldn't know what to do if my boss should come to me and say that I would have to match a stain or filler without burnt sienna and burnt umber . . . I will be glad to give more information about the earth colors or suggest what to use in their place.—RUSSELL DAVIS.

CHRISTMAS SEALS

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Labor Turnover in the Finishing Room

★ Labor turnover has always been a serious problem to foreman finishers and it is becoming a greater problem for several reasons, a few of which are as follows:

1) Many concerns have installed conveyor systems which have eliminated much of the unskilled labor. Most of the men that work on conveyors must be skilled.

2) The selective draft is sure to call many skilled men and thus remove them from their jobs.

3) The amount of "floating" labor is increasing yearly.

4) Improved finishing methods and mass production require more skilled men than ever before.

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A large labor turnover not only curtails production but causes inefficiency and poor workmanship in the finishing room. For example: A foreman finisher hires a man who says he is "experienced," and puts him to work; then he finds the man can not perform his duties skillfully and satisfactorily; often he cannot produce at all on the job. The foreman finisher must discharge him or turn him over to an experienced man to train. In the latter case, he will be on the payroll for several days while he isn't producing. Then this fellow may not be dependable. As soon as he is trained he may leave, thus causing the company that trained him a lot of trouble and expense for nothing.

Suppose the foreman finisher hires an experienced spray man, but doesn't know that this man has never stayed on one job long at a time. Regardless of how much experience a man has had, when he changes jobs it usually takes him several days to get accustomed to the routine and methods employed on his new job and thus attain his maximum efficiency on the work. So the new man stays a few days or a few weeks and then moves on. All of this causes the foreman a lot of wasted time, and costs his company a lot of money.

Much of this labor turnover can be eliminated if the foreman finisher will investigate the record of every man he hires—that is, as to his reliability, dependability, etc. He should demand a letter of recommendation from the man's former employer, and find out how long he was employed on the former job.

I keep a note book in which I

list the names of the men who come to me from time to time wanting a job. I investigate these men and find out, if possible, their reason for leaving their last position; or if, they are still employed, their reason for wanting to change, etc. Then, when one of my men quits, I usually know someone who I can get to fill his place. I don't have to hire the first man who comes along, whether he is the man I need for the job or not.

Of course, these suggestions, if followed, will not eliminate all of the labor turnover, but they will help reduce it.—H. W. CHESTER.

Infra-Red Baking

★ The recent development and promotion of infra-red baking of industrial finishes has brought up a new crop of misconceptions, such as always accompanies revolutionary methods or processes.

The idea seems to prevail that infra-red baking will speed up, to practical advantage, any paint-baking process. This is definitely not so. Infra-red will bake fast-baking materials (10 to 15 minutes @ 300°F. types) faster than conventional ovens, but the slower baking types of enamels (1½ to 3 to 5-hr. bakes) do not respond to infra-red in any way near the sensational manner which some publicity would lead one to expect.

Considering that the faster the baking speed of an enamel, the less the number of lamps required and the less the power consumption, it is not hard to see the reason for the use of high-bake urea-formaldehyde type enamels on most infra-red installations now operating. It follows that the selling price of the item being finished must warrant the use of a high-grade finish.

This is not a condemnation of infra-red baking. It merely means that *finishing materials intended for infra-red baking must be formulated specifically with this process in mind.—D. H.*

Selecting Reducers

★ The final characteristics of paint films depend largely on the solvents used in reduction, regardless of temperature or humidity control. Naturally, absolute control of these two drying elements allows the use of cheaper and faster-drying solvents for both air-drying and baking materials.

The main drying characteristics may be said to cover the three following results:

1) Unbalanced or poor reducers may cause the solids to dry as a cracked or crystalline deposit. If not immediately apparent, this condition may occur before the finished product reaches the consumer, or soon thereafter.

2) The solids may separate into an amorphous (porous) deposit. A porous coating means early chalking and premature perishing of the film.

3) Properly selected reducers, used in the reduction of enamels, will allow no visible separation of vehicle and, as the drying concentration increases, the vehicle become more viscous, with the solids becoming a viterous-like deposit when dry.

These are the three main characteristics of reduced paint-vehicles in the stages of drying, although many intermediate conditions occur. For real protection and insurance, use the reducer recommended by your finish manufac-

turer. Experiment at your own risk.

Poor reducers, as well as poor vehicle formulation, will cause bad pigment dispersion in various degrees. Improper dispersion of pigments means premature perishing of all coatings. These facts can best be explained by considering that a mutual effect is exerted between vehicle and reducer, and on this depends the final character of the film, whether it is primer, surfacer or finish coat.

This should prove that deposit types are structures whose formation and longevity depend greatly on the solvents used in vehicle formulation and in their reduction for application.

In respect to the various reducers, all vehicles are not necessarily over-sensitive, but from the practical standpoint—to date, at least—it is always best to choose the best materials available to obtain a lasting film of quality.—G. L. HARDY.

Use Conditioned Sandpaper

* Sandpaper costs money. Any abrasive paper cost can be a source of considerable expense, or the cost can be held at a minimum by simply storing the reserve supply in a suitable storage space. Some workmen get the idea that because the abrasive paper is used for dry sanding, it should be stored in a hot dry part of the shop. The fact is that the abrasive is held to the paper with a glue bond, and if the paper is stored in a place that allows it to become dry and brittle it will naturally crack easily and the abrasive will not cling to the glue bond as it should.

I recommend that abrasive paper be stored in a part of the shop where the air is slightly moist, but

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not excessively so. If no such place is available, then a container of water can be placed in the cabinet where abrasive paper is stored. It will be noted that the abrasive paper can be folded without breaking when it is not dried out to the point where it is practically useless.—H. G.

Low-Bake Synthetic Varnishes

* The new high-solids low-bake synthetic varnishes are here to stay, even though many firms are skeptical of them for various reasons. In the testing laboratories and in the field they are proving that they "can take it"; in other words, they show excellent performance and durability.

These varnishes were originally produced for the radio cabinet industry, in order to cut out one top coat and also to speed up production in the finishing room.

The most troublesome feature of this type of varnish is the bloom which sometimes persists in showing after 24 to 48 hours, and which may come back repeatedly. This was thought to be produced by the oil in the rubbing solution, but we found that it was due more to the size of the abrasive used as a cutting agent than to any other one thing.

We now have that taken care of, as well as most all other troubles which were experienced by users of this product. A 100% cut of this same varnish baked at 140° F. for one hour is an excellent sealer, as it produces a satisfactory body that sands well, plus a good knit which produces a tough durable finish.

One heavy coat of this varnish, baked for two hours at 140° F., is equal to two or more coats of good-quality lacquer, and I am sure we can expect to see more of it used in the coming months.—HAROLD DEAN.

Improved Baked Finishes

Today finish drying and baking operations must meet demands for increased speed of production, improved appearance and durability of coatings, reductions in fuel and labor costs, and savings in floor space. Safety, too, is of paramount importance.

Accurate engineering data, pertaining to oven equipment for bake-finishing operations has been compiled by industrial oven manufacturers whose organizations have had many years of experience in this specialized line of activity.

Expert use of this engineering data enables competent oven engineers to analyze special bake-finishing problems quickly and intelligently and to submit recommendations, drawings, specifications and

prices on the particular type and design of oven that will be most advantageous for present and possibly future requirements.

The employment of correct engineering principles assures the incorporation of safety, speed, economy and efficiency in these vitally important industrial drying processes.

Concerns who now have or are likely to have bake-finishing operations in connection with their production, will do well to investigate the latest equipment developed by progressive oven manufacturers. It is to their interest, as well as to the interest of their employes and customers, to have in service whatever offers the maximum results in efficiency, economy and safety.

Help the Paint Manufacturer to Help You

* Below is a copy of a telegram typical of hundreds that must be received yearly by paint manufacturers in the United States.

SEND SERVICE MAN AT ONCE. HAVING TROUBLE WITH BAKING ENAMEL.

When one needs help he can expect more certain relief if he specifies what his trouble is, even though it runs over ten words.

Every reputable paint manufacturer keeps samples representing shipments. A capable service man can, in the majority of cases, locate the basis of a customer's trouble by an examination of these samples—provided he knows what particular kind of trouble the customer is having. If he cannot solve the trouble in this way, he can at least eliminate a great many factors before going to the customer's plant, and this makes possible a more rapid and accurate analysis there.

Specifically stating the trouble will also enable the paint manufacturer to send the best qualified man. As an example, a customer wired as in the sample just given. The manufacturer sent a baking enamel expert immediately. Upon arrival the service man found that the baking enamel was working well, as always before. What was troubling the customer was slight evidence of corrosion on some units that had been in service for several months. The service man was able to recommend a number of rustproofing methods. Had the paint company known the exact nature of the trouble, they could have sent another man who was particularly well versed in rustproofing methods.

Read about the many NEW DESPATCH FEATURES that improve finishes and permit new savings. They are presented for the industry in the new DESPATCH BULLETIN NO. 51

DESPATCH OVEN COMPANY

MINNEAPOLIS MINNESOTA

Thus, by not sending proper details, the customer was deprived of the best technical advice on his problem.—R. H.

Easy Sanding Sealer

★ Beware of a sealer that sands too easily and "powders up" when rubbed with sandpaper. This type of sealer is generally preferred in most finishing departments, but it does not produce a durable hard finish. Its easy-sanding qualities are generally an indication that a lot of stearate has been used in the sealer.

Some finishers depend on this sanding of the sealer coat to get a perfect surface for their following or finishing coats. The type of sealers that contain a large amount of stearate or other "easy-sanding" materials are generally brittle, and the lacquers or other coatings that are put over them will have little adhesion and will "scratch off" easily.

In order to produce an excellent hard-wearing durable finish, I would rather eliminate the sealer altogether and start with lacquer right over the filler or stain; then follow with the same material until the finish is completed.

The finishing department that has to depend on a heavy coat of easy-sanding sealer to produce a smooth surface on which to apply finishing coats, is the one that receives furniture from its cabinet department in a rough or half-sanded condition, and therefore has to depend on finishing material to build up a smooth surface. This process is more expensive than preparing the furniture in the cabinet department by sponging and sanding its surfaces properly before it is delivered to the finishing room. —FRED ROSEN.

New Chicago Office and Warehouse for Detroit Rex

The Detroit Rex Products Co., manufacturer of degreasing machines, solvents, industrial alkali compounds and dry-cleaning equipment, has moved its Chicago office to larger quarters at 1166 W. Cermak Road.

Mr. S. Crooks, regional manager, states that in connection with these new modern offices there will be an equipment display room and complete warehouse facilities where stocks of degreasing solvents and alkalies will be maintained for quick delivery in the Chicago region.

In addition to field sales and service engineers working out of this office, a permanent resident design engineer is employed.

The midwestern states are all served from the Chicago office, as a control center with branches in Milwaukee and St. Louis. Stocks of solvent are also carried in these branch offices for prompt out-state delivery.

Classified Advertising

FOREMAN NOW EMPLOYED

Desires new connection either as finishing foreman or demonstrator. Fourteen years' experience in automotive and metal furniture lines; thorough knowledge of spraying, dipping, machine graining, color matching and conveyor systems. Have handled all types of materials. Understand costs and production; can handle any number of men. Prefer Cleveland or Los Angeles districts. Address IF-826, care Industrial Finishing.

PANEL FINISHER WANTED

By reputable manufacturer of wood finishing materials. Must be capable and have had several years' experience in wood finishing. Address IF-835, care Industrial Finishing.

SALESMAN WANTED

By a leading manufacturer of finishing materials. This company is located in the Middle West and is well established in the industrial field, in fact, is a consistent user of display advertising space in this magazine. Applicant should be experienced in selling of wood or metal finishes and should have a wide acquaintance in the Chicago territory. Good proposition for right party. Address IF-836, care Industrial Finishing.

STAIN AND FILLER MAN

With 25 years' experience in formulating and manufacturing stain, fillers and specialties for the furniture trade. Practical finisher, American, desires connection with established firm manufacturing these materials or one desirous of entering this field. Address IF-834, care Industrial Finishing.

FOREMAN FINISHER

Now employed, formerly of Grand Rapids, has had 22 years of diversified experience on all kinds of furniture. Wide experience in color matching and mixing of stains. Desires new connection, preferably in the South. Can furnish excellent references. Address IF-825, care Industrial Finishing.

WEST COAST CONNECTION DESIRED.

Salesman, successful, experienced, lacquer and synthetics, will consider drawing account proposition from West Coast manufacturer to cover West Coast. Address IF-827, care Industrial Finishing.

ONE OR TWO SIDE-LINES

Wanted by finishing material salesman calling on trade in central and southern states—Texas, Okla., Fla., Ark., Ind., Ohio and W. Va. Travel on commission basis and want something that can be sold to buyers of industrial finishes. Address IF-828, care Industrial Finishing.

POSITION WANTED.

Can you use a man with twenty years' nationwide experience as branch manager, sales manager and technical director of two widely known industrial finishing houses; who has kept abreast of raw material, equipment and technical developments; and who seeks a new connection in the finishing material, equipment or raw material field where he can make full use of his knowledge, experience, ambition and industry? Full details furnished upon inquiry to IF-829, care Industrial Finishing.

FINISHING FOREMAN WANTED.

Fully experienced on living room furniture. Must be able to match stains. Position will be available in Middle West about January 1st. Address IF-830, care Industrial Finishing.

PAINT SALESMAN WANTED.

Detroit manufacturer has openings for competent industrial salesmen. Territories available include Chicago, outstate Illinois, Wisconsin, also southern territory including Tennessee, North Carolina and Georgia. An acquaintance among the trade in these sections is essential. Our products include finishes for all classes of industrial trade and you must be capable of handling diversified finishing problems. Technical training desirable but not essential if a successful previous record can be shown and you have practical experience in finishing problems. Give detailed information regarding yourself, record of previous and present employment and references. Address IF-831, care Industrial Finishing.

PAINT SALESMAN WANTED.

Eastern manufacturer of industrial finishes requires services of an experienced salesman of industrial finishes for established territory in Eastern Penna. State age, references and experience in detail. Remuneration, salary and bonus. Our salesmen are aware of this advertisement. Address IF-833, care Industrial Finishing.

LACQUER SALES REPRESENTATIVE

Wanted by an established eastern manufacturer of Lacquers and Solvents. Splendid opportunity for man with following. Commission and drawing account. In reply state volume and territory covered. All communications confidential. Address IF-832, care Industrial Finishing.

SALESMEN AND DISTRIBUTORS

The Alexander Milburn Co. has openings for qualified representatives for

The famous "Hollow Air" OM Spray Guns

Welding and Cutting Torches Inter-changeable Tips

Latest Improved Regulators

Favorable Terms.

THE ALEXANDER MILBURN CO.
1418-28 W. Baltimore St., Baltimore

Save from 30% to 60% on

Paint spray equipment. Trade in your out-of-date spray guns, fans, booths, compressors, etc., on new or rebuilt equipment. As the largest dealer in rebuilt equipment we are able to offer liberal allowances on your old equipment. Every item guaranteed. We have:

Air compressors (large and small).
Air and material hose and connections.
Spray guns (rebuilt) all standard makes.
Pressure tanks.
Spray booths and other specialties.

We have it and can save you money . . . write today.

M. & E. MANUFACTURING CO.
720 S. Meridian St., Indianapolis, Ind.
Established 1913
Distributors of Binks entire line.

READ the January, 1941 annual review edition . . .

All the latest news on

FINISHES

A review of the latest finishes for the conditioning, surface preservation, decorating and polishing of products made of wood, metal and various compositions will be presented as a feature of this issue. Every user of materials, supplies and equipment having to do with production-finishing should get a copy of this edition. It will have lasting as well as immediate value.

OUT JANUARY 18TH

Industrial FINISHING

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To our many friends,
and to all readers of

INDUSTRIAL FINISHING—

We Say

MERRY CHRISTMAS
HAPPY NEW YEAR

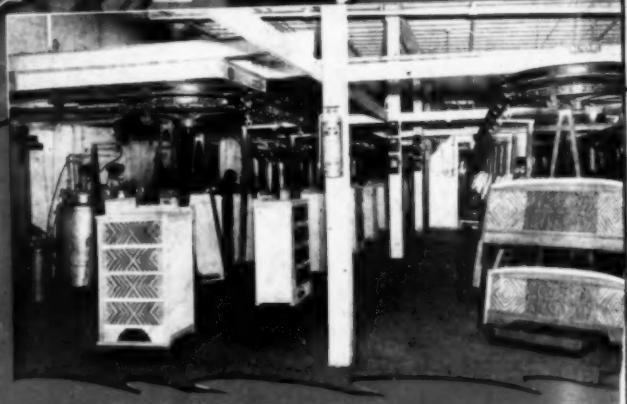
and the best of
GOOD WISHES

ADVANCE PAINT COMPANY
Manufacturers of Wood & Metal Finishing Materials
INDIANAPOLIS, INDIANA

Another finishing room

The photograph below shows the loading of the cases on the trays and miscellaneous small pieces on intermediate J-Type Hooks

Planned Engineered Conveyorized



The Spray Booth on the left hand side is the wiping stain spray booth. Spray Booth to the right of center of picture is sealer spray.

by PALMER-BEE at the plant of the Memphi Furniture Manufacturing Compan

The above installation is typical of the many furniture plants equipped with Palmer-Bee conveyors. At no cost to you one of our skilled engineers will analyze your plant and production, submit a plan and program through your finishing room — warehouse — cabinet room — machine room. Avail yourself of this service.

PALMER-BEE CO., DETROIT, MICH